KIMYO UCHUN MATEMATIKA

Maktab o'quvchilari va oliy o'quv yurtlariga tayyorlanayotgan abituriyentlar uchun kimyo fani masalalarini kalkulator yordamisiz ishlash uchun qulay bo'lgan usullar va ulardan mashqlar.

Mualliflar :

Abdug'affor Mutalibov shogirdlari :

Hikmatullayev Behzod

Komiljonov Abdulloh

«Tafakkur»

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Taqrizchilar :

Qushboqova Shoxista: 142-sonli IDUM matematika o'qituvchisi

Ushbu kitobni tayyorlashda yordamini ayamagan **Nasrullayev Bahrom**, **Azimov Muhammadjon**, **Madyunusova Kamola**, **Abdurahimov Ibrohim**, **Abdusattorov Ibrohim**, **Mirhamidov Mirilyoz**lar va ayniqsa, **o'zbek tili va adabiyot o'qtuvchisi Ahmedova Dilbar Obidovna**ga mualliflar o'z minnatdorchiligini bildiradilar.

Bizning telegram kanalimiz: @Kimyo_TV

Muqaddima

Assalomu alaykum aziz o'quvchi va abiturentlar. Sizlarga bu kitobimizni taqdim etar ekanmiz, avvalombor kichkina va kamtarona xizmatimizni robbimiz qabul qilishini, insonlarga esa foyda, naf keltirishini so'rab qolamiz.

Bu kitob asosan kimyo fani va ba'zi aniq fanlarda arifmetik amallarni oson hisoblashga yordam beruvchi usullardan iborat. Mazkur kitobimizda keltiriladigan ba'zi usullar maktab darsliklarida uchramaydigan hisoblash usullaridir. Ba'zi usullar jamoat orasida keng tarqalgan, ba'zi usullar esa amalda o'xshashi yo'q bo'lib, yangilik deb qabul qilishingiz mumkin. Kitobimizdagi usullar bir necha yillar davomida amaldagi abiturentlar orasida keng sinovdan o'tkazildi. Bu usullarni mukammal egallagan abiturentlarga bu usullar juda qulaylik keltirib, ularning imtihon vaqtidagi qiyinchiliklarni sezilarli darajada kamaytirganini ta'kidlashdi. Albatta, bu usullarni to'g'ri tadbiq qilolmagan o'quvchilar ham bor. Kuzatuvlarimiz shuni ko'rsatdiki, ba'zi abiturientlar bu usullarni qo'llay olmasliklarining asosiy sababi, boshlang'ich arifmetik bilimlarining kamligidir. Shuning uchun biz matematika fanidan boshlang'ich bilimlaringizni mustahkamlab olishingizni maslahat bergan xolda boshlag'ich bilimga doir mashqlarni ham tuzib chiqishga muvofiq bo'ldik, maqsadimiz sizlarni bilimingizni oshirish va oliy o'quv yurtlariga tayyorgarlik jarayonida sizlarga oz bo'lsada yordam berish.

Harakat bizdan muvaffaqiyat esa robbimizdan, zero u bizga xatto ota-onamizdan ham mehribon zotdir. Shunday ekan, undan bizga foydali bilim berishini va o'rganganlarimizni manfaatli qilishini, qilganlarimizni xolis o'zi uchun bo'lishini va bardavom qilishini so'rab qolamiz.

Sizlarga hurmat ila ikki dunyo saodatini tilab qoluvchi do'stlaringiz, **Hikmatullaev Behzod va Komiljonov Abdulloh.**

Fikr va mulohazalaringizni bizni telegram kanalimizga yuborishingiz mumkin. Sizning fikrlaringiz bizni qiziqtiradi : @Kimyo_TV

QO'SHUV

Al-Xorazmiyning ajoyib tenglamasi

Matematik olim Al-Xorazmiydan inson haqida so'rashganda olim shunday dedi :

Agar inson chiroyli xulq sohibi bo'lsa, u 1 ga teng
Agar chiroy sohibi bo'lsa, 1 ning yoniga 0 ni qo'sh =10 bo'ladi
Agar u boy bo'lsa, yana bir 0 ni qo'sh = 100 bo'ladi
Agar nasl–nasabli bo'lsa, yana bir 0 ni qo'sh = 1000 bo'ladi

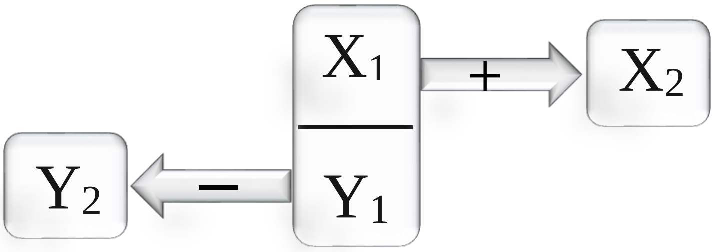
Agar 1 raqami yo'q bo'lib ketsa, faqat 000 qoladi va ular hech qanday qiymatga ega bo'lmay qoladi !!

YAXLITLASH

Yaxlitlash usulida bir–biriga qo'shish qiyin bo'lgan sonlarni qo'shishni osonlashtiradigan sonlarga aylantiriladi.

Qo'shish qoidasi

Bunda yaxlitlash qarama-qarshi tomonga bo'ladi. Ya'ni yaxlitlangan son qo'shish orqali bo'lgan bo'lsa → natijadan huddi shuncha ayiramiz, agar ayirish orqali bo'lgan bo'lsa → natijaga huddu shuncha qo'shamiz



Eslatma : qo'shish usulida har ikkala qo'shilayotgan sonlarni yaxlitlash mumkin

Masalan (1) :

$$138 + 155 = 293$$

1) Bizga 155 noqulay son bo'lgani uchun 155 dan **5** ni ayirib 150 qilib olamiz : 155 – **5** = **150**

$$\begin{array}{r} 138 \\ +\ 150 \\ \hline 288 \\ +\ 5 \\ \hline 293 \end{array}$$

2) 138 + 150 = 288

3) Endi qo'shishdagi qoidamizga asoslanib, chiqqan son–288 ga biz ayirib tashlagan **5** ni qo'shib qo'yamiz.

4) 288 + 5 = **293**

Masalan (2) :

$$134 + 188 = 322$$

$$\begin{array}{r} 134 \\ +\ 200 \\ \hline 334 \\ -\ 12 \\ \hline 322 \end{array}$$

1) Qo'shish uchun 188 noqulay son bo'lgani uchun 188 ga **12** ni qo'shib, 200 qilib olamiz : 188 + **12** = 200

2) 134 + 200 = 234

3) Endi qo'shishdagi qoidamizga asoslanib, chiqqan son 334 dan biz qo'shgan **12** ni endi ayiramiz.

4) 334 - 12 = **322**

Hayotda shunday odamlar borki, ular faqat orzu qilishadi.

Shunday odamlar ham borki, ular orzusini haqiqatga aylantirish uchun tong sahardan harakat qilishadi

Video tushuntirish — **YouTube** : Kimyo uchun Matematika "Qo'shishda yahlitlash 1,2-misol"

Masalan (3) :

$$244 + 136 = 380$$

$$244 + 136 = 380$$

+ 6 — − 6

$$250 + 130 = 380$$

2) Biz 136 dan ayirgan 6 ni endi qo'shamiz.

1) 136 dan **6** ni ayirib, bizga qulay son **130** ga yaxlitlaymiz

Masalan (4) :

$$187 + 95 = 282$$

$$187 + 95 = 282$$

− 5 — + 5

$$182 + 100 = 282$$

2) Biz 95 ga qo'shgan 5 ni endi ayiramiz.

1) 95 ga **5** ni qo'shib, bizga qulay son **100** ga yaxlitlaymiz

Video tushuntirish — **YouTube** : Kimyo uchun Matematika "Qo'shishda yahlitlash 3-misol"

Qo’shuv (+) 1-12 bosqich

No	1-bosqich		2-bosqich		3-bosqich		4-bosqich		5-bosqich		6-bosqich	
1	11+7=		29+14=		37+23=		35+36=		42+60=		113+115=	
2	8+6=		23+17=		17+18=		33+43=		54+72=		125+102=	
3	12+5=		18+27=		31+32=		56+31=		72+74=		109+112=	
4	8+14=		10+24=		22+42=		25+55=		59+30=		146+70=	
5	12+8=		28+29=		33+20=		42+26=		69+47=		116+93=	
6	5+6=		13+25=		37+25=		48+21=		50+69=		80+144=	
7	12+8=		15+24=		22+29=		51+52=		42+69=		114+79=	
8	5+13=		19+10=		30+20=		40+23=		31+52=		79+127=	
9	6+13=		18+10=		30+29=		21+30=		30+51=		120+90=	
10	14+13=		13+21=		25+41=		52+31=		61+28=		109+149=	
11	8+11=		18+22=		32+20=		25+43=		27+30=		145+135=	
12	6+12=		12+16=		41+15=		58+28=		28+45=		98+74=	
13	14+6=		26+22=		32+38=		41+41=		61+69=		104+88=	
14	14+9=		11+17=		24+40=		38+34=		48+46=		139+100=	
15	10+7=		17+28=		20+34=		44+22=		27+42=		136+123=	

No	7-bosqich		8-bosqich		9-bosqich		10-bosqich		11-bosqich		12-bosqich	
1	112+212=		220+240=		334+320=		466+284=		517+537=		390+744=	
2	240+189=		211+178=		316+362=		387+350=		463+391=		711+588=	
3	195+156=		236+308=		215+396=		250+518=		379+326=		728+544=	
4	160+198=		329+280=		259+254=		517+253=		517+430=		491+672=	
5	212+172=		194+310=		356+398=		346+508=		602+542=		400+592=	
6	109+161=		206+185=		214+206=		346+363=		572+409=		529+736=	
7	133+243=		192+247=		435+424=		364+424=		587+628=		690+413=	
8	168+179=		218+277=		308+383=		394+516=		470+478=		674+515=	
9	162+170=		252+199=		344+253=		430+315=		455+464=		691+668=	
10	130+211=		176+204=		343+226=		295+382=		384+533=		429+615=	
11	148+170=		194+223=		314+267=		485+480=		434+440=		471+380=	
12	121+195=		338+227=		257+237=		396+343=		486+525=		527+573=	
13	145+120=		177+190=		248+279=		279+315=		478+560=		748+435=	
14	245+162=		206+313=		353+439=		292+545=		427+378=		356+581=	
15	247+145=		307+228=		260+306=		431+423=		311+608=		614+459=	

Qo’shuv (+) 13-22 -bosqich

No	13-bosqich		14-bosqich		15-bosqich		16-bosqich		17-bosqich	
1	435+770=		553+659=		611+627=		699+1139=		891+986=	
2	652+734=		790+519=		1037+706=		1059+861=		1116+614=	
3	740+771=		571+840=		678+1008=		1073+1019=		1102+1026=	
4	589+650=		939+890=		625+670=		848+899=		1091+836=	
5	474+511=		837+940=		690+572=		703+572=		1078+999=	
6	685+499=		620+840=		745+763=		1044+646=		703+1202=	
7	607+775=		875+500=		645+725=		963+570=		890+610=	
8	743+521=		463+895=		565+695=		837+594=		1037+991=	
9	681+835=		519+714=		723+640=		799+749=		631+728=	
10	687+537=		664+824=		946+855=		1072+827=		1060+852=	
11	580+662=		807+759=		939+691=		838+765=		1009+646=	
12	511+434=		604+769=		881+864=		1034+881=		1011+1104=	
13	404+408=		809+797=		874+746=		632+823=		1222+619=	
14	485+722=		744+935=		679+557=		635+681=		836+710=	
15	752+771=		773+583=		615+812=		711+1014=		641+1151=	

No	18-bosqich		19-bosqich		20-bosqich		21-bosqich		22-bosqich	
1	1154+1295=		1224+1130=		1053+832=		1425+1395=		1125+1182=	
2	812+920=		1158+1104=		810+1356=		460+1613=		1103+1273=	
3	1095+1120=		1386+1177=		786+889=		1068+1317=		1018+1551=	
4	1109+689=		926+1395=		1436+1025=		1119+1109=		1749+1156=	
5	959+1205=		1296+853=		1147+1482=		1311+1034=		1476+1695=	
6	674+1270=		895+1181=		1103+1099=		1451+1213=		1692+1458=	
7	655+873=		1410+1325=		899+1532=		859+1622=		1050+1240=	
8	1247+746=		1080+987=		1467+1040=		833+1309=		911+1732=	
9	1218+1219=		1023+841=		1481+974=		1257+1587=		1632+1636=	
10	976+1157=		723+1245=		902+1138=		1299+1004=		1390+1121=	
11	1258+767=		1447+706=		986+855=		1491+1034=		1377+1724=	
12	1166+1131=		851+1387=		945+931=		1330+1124=		1526+1302=	
13	1116+992=		1288+1099=		937+1263=		1338+1015=		1312+1494=	
14	846+1062=		918+1011=		1226+1286=		869+1636=		970+1542=	
15	772+935=		969+1002=		907+1360=		1337+985=		887+1110=	

Qo'shuv (+) 23-32 -bosqich

No	23-bosqich		24-bosqich		25-bosqich		26-bosqich		27-bosqich	
1	899+899=		901+1109=		1766+1867=		1715+1662=		1168+2116=	
2	1103+875=		1016+1363=		1519+1776=		1607+1880=		2029+1954=	
3	1460+900=		1805+1629=		1709+1491=		2062+2055=		1201+2085=	
4	1739+903=		922+901=		1258+1263=		1992+2042=		1852+1663=	
5	1070+1170=		1751+973=		1308+1659=		1223+1254=		1218+1640=	
6	870+1736=		1505+1752=		1607+1976=		1613+1137=		2227+1263=	
7	1319+1503=		1506+1826=		1158+1238=		1984+1975=		2137+1511=	
8	921+1511=		1495+1140=		1506+1750=		1592+1356=		1220+1238=	
9	1357+890=		1611+1023=		1947+1687=		1783+1707=		2062+1975=	
10	1375+1684=		1261+1888=		1739+1794=		1123+1647=		2105+1294=	
11	1060+1018=		1713+1293=		1567+1170=		1417+2039=		2074+1309=	
12	1538+1215=		1631+1415=		1950+1305=		1717+1315=		1402+1423=	
13	894+905=		1778+1499=		1504+1536=		1263+1211=		1495+1679=	
14	1647+1028=		1138+1117=		1424+1684=		1530+1374=		1461+2097=	
15	1279+1622=		1574+1642=		2001+1403=		1833+1285=		1586+1792=	

No	28-bosqich		29-bosqich		30-bosqich		31-bosqich		32-bosqich	
1	2344+2028=		1779+2374=		1691+2184=		1652+1346=		2654+1476=	
2	1928+1856=		1982+2230=		1993+2512=		1986+2288=		1847+2475=	
3	1994+2250=		2120+1390=		2278+2041=		2173+1629=		2398+1423=	
4	1192+1605=		2004+1460=		2113+2084=		2105+1787=		2056+2575=	
5	2197+1196=		1963+1906=		2122+1262=		2520+1743=		2478+1888=	
6	1789+1617=		2198+1769=		1481+2299=		2184+1750=		2190+2571=	
7	1226+1931=		1558+2243=		1978+2502=		1614+1472=		1438+2331=	
8	2211+1560=		1921+2022=		2546+2458=		1562+1869=		1844+2527=	
9	1462+1567=		2436+1954=		2135+2201=		2035+1458=		1359+2386=	
10	1490+1787=		1790+2200=		1272+1363=		3433+2178=		2517+2728=	
11	2239+2129=		1210+2245=		2058+1494=		1465+1364=		2093+2643=	
12	1327+2184=		2154+2126=		2533+2392=		1658+1752=		2642+1509=	
13	2043+1443=		2265+2043=		2415+1506=		1354+2409=		2109+1369=	
14	1517+1195=		1974+1657=		2548+1461=		1384+2226=		2128+2400=	
15	1186+2219=		2373+2126=		1503+2395=		2453+1379=		1580+2330=	

Qo’shuv (+) 33-42 -bosqich

No	33-bosqich		34-bosqich		35-bosqich		36-bosqich		37-bosqich	
1	2264+1705=		2797+2713=		2119+2207=		1770+1914=		1665+3098=	
2	2381+2148=		2171+2148=		2502+1869=		2652+2010=		1949+1707=	
3	1794+2037=		2517+2099=		2019+2295=		1732+2927=		3133+2614=	
4	2678+2031=		1541+2915=		2920+1987=		2604+2828=		2353+2778=	
5	1706+2585=		2516+1488=		1525+2802=		2400+3055=		2258+2190=	
6	2245+2299=		2559+2386=		2808+2734=		2399+2942=		2167+2261=	
7	2018+2413=		2310+1883=		2545+2581=		2062+1916=		2324+1911=	
8	2251+1882=		2037+2895=		2111+2654=		2455+2725=		1639+2135=	
9	2348+1438=		2118+2590=		2097+2607=		2996+2045=		1996+2018=	
10	2169+2592=		2468+2463=		3036+2743=		1703+2384=		1818+2918=	
11	2189+2439=		1999+2778=		2399+2770=		2749+2036=		2653+2617=	
12	2595+1833=		1758+1547=		2099+2239=		2699+2369=		2700+1794=	
13	2163+1791=		2254+2728=		2649+2820=		2919+2401=		2457+3046=	
14	2662+2082=		2279+2726=		3019+2904=		3131+2343=		2680+2228=	
15	1435+1674=		2694+2373=		2409+2913=		2746+2870=		3015+1724=	

No	38-bosqich		39-bosqich		40-bosqich		41-bosqich		42-bosqich	
1	3247+2770=		3438+2732=		2161+3390=		1840+3190=		2058+2583=	
2	2634+2020=		2047+1733=		2248+3442=		2972+3143=		3386+3174=	
3	2941+2801=		3155+2785=		2332+2158=		2022+2649=		2656+2315=	
4	1890+2770=		2283+1838=		3217+1758=		2519+3061=		2277+2637=	
5	2259+3257=		3121+3341=		2916+2089=		2909+3401=		2001+3658=	
6	2589+2137=		2557+2441=		2311+2062=		3157+1992=		2895+1949=	
7	2348+3270=		2011+2549=		2089+2949=		2739+2533=		2380+2885=	
8	2415+2225=		1949+3371=		3133+2085=		3341+2071=		3274+2938=	
9	2160+2879=		1949+3371=		2052+2404=		1805+3604=		2201+2558=	
10	2572+2711=		2789+1780=		3022+2620=		3529+3335=		3463+3679=	
11	2874+2315=		2542+3144=		2183+2367=		2110+3618=		3444+2768=	
12	2886+2281=		2119+2346=		2699+1885=		2418+2290=		2970+3729=	
13	2996+3208=		3400+3427=		3280+3147=		3102+2292=		3519+3391=	
14	3089+3219=		3430+2917=		3156+1824=		3275+3388=		2000+2409=	
15	1951+2983=		1805+2341=		2077+3023=		2901+2863=		2137+2891=	

Qo'shuv (+) 43-52 -bosqich

No	43-bosqich		44-bosqich		45-bosqich		46-bosqich		47-bosqich	
1	2164+3735=		3370+2717=		3334+2783=		2921+3602=		3328+2722=	
2	3524+1993=		2696+2302=		2266+2915=		4003+2284=		3761+2449=	
3	3186+3671=		2835+2507=		3897+4008=		3843+2505=		3106+3785=	
4	2039+2417=		2231+3942=		3369+2232=		3411+3371=		3258+3087=	
5	3453+2663=		2079+2715=		3444+3896=		3327+2439=		2543+2167=	
6	3736+2225=		3401+2366=		2224+2369=		2976+2074=		3805+2166=	
7	3838+3537=		3564+3899=		2513+2666=		3290+3865=		3105+3250=	
8	3477+3730=		2133+2816=		2205+2365=		3160+4080=		2932+2674=	
9	2784+3654=		2671+2157=		3042+2314=		3124+2476=		2460+2414=	
10	2075+1908=		2814+2949=		2526+3158=		3632+2900=		2874+3386=	
11	3243+3219=		2917+3749=		3536+3811=		2370+3357=		2864+8357=	
12	3781+2549=		3169+2846=		3498+2124=		4019+3414=		2245+3022=	
13	3225+3734=		2846+2014=		2146+2348=		2466+3947=		2801+2108=	
14	3801+2175=		2480+2669=		2083+2988=		2889+2566=		4196+2809=	
15	3283+2215=		3721+2489=		3739+2188=		2393+3897=		2127+2270=	

No	48-bosqich		49-bosqich		50-bosqich		51-bosqich		52-bosqich	
1	4121+2182=		4300+3922=		2638+4324=		3480+2420=		2785+3542=	
2	3646+2997=		4336+2259=		3143+3463=		3690+2660=		2560+2651=	
3	3269+4095=		3236+2805=		4061+4141=		4218+3372=		4233+4084=	
4	2207+2589=		2455+2896=		3322+4021=		3587+3156=		4389+3797=	
5	2559+2520=		3702+4281=		3518+2904=		2982+2609=		3745+3706=	
6	2535+3934=		2656+3527=		3252+2530=		3354+2411=		4035+3763=	
7	3938+2773=		3905+2941=		2949+2743=		3814+2565=		2624+4295=	
8	2633+4220=		3265+2637=		2598+3522=		2333+2454=		2424+2740=	
9	4010+3699=		2911+2538=		7284+3691=		3259+4460=		4648+3307=	
10	2362+2958=		4134+2616=		2382+4439=		2343+3515=		3858+3344=	
11	3189+3789=		2235+3466=		2251+2516=		2807+4435=		3201+4544=	
12	2368+3259=		2970+3266=		2712+3057=		3510+3334=		3233+2614=	
13	4102+4089=		3151+2402=		3012+2797=		3964+4491=		2530+2360=	
14	3717+4262=		2512+2317=		4323+3223=		3250+3999=		2429+2816=	
15	2545+3683=		3387+2698=		4307+3842=		3201+4197=		3229+4570=	

Qo'shuv (+) 53-62 -bosqich

No	53-bosqich		54-bosqich		55-bosqich		56-bosqich		57-bosqich	
1	3148+4099=		2947+4350=		3489+2999=		3220+4799=		5217+3087=	
2	3090+3316=		4709+3335=		4098+3700=		4260+3136=		3321+2985=	
3	2811+2853=		2927+4918=		3514+4735=		3654+3496=		5008+3568=	
4	4132+3966=		4204+3370=		4381+3179=		4976+3479=		4658+3888=	
5	2659+4012=		3191+4508=		4343+4047=		2814+4640=		5042+4746=	
6	3887+2412=		3090+2761=		5015+2859=		3541+2612=		3618+5048=	
7	4115+3218=		3048+3716=		3262+3252=		2809+4534=		4668+4379=	
8	3700+3159=		3315+3348=		4819+3282=		3494+3261=		4044+4837=	
9	4435+2490=		4713+3643=		3264+4830=		3046+4803=		3037+3212=	
10	3951+3495=		2833+4247=		4152+3292=		3467+2675=		3808+4263=	
11	3768+2915=		4399+4346=		3424+4542=		3442+4638=		3057+4327=	
12	4482+4143=		4018+2849=		2912+2698=		5076+4871=		4505+4787=	
13	3266+2891=		3970+2451=		2765+2578=		2966+2612=		3408+3259=	
14	2760+3606=		3676+3043=		3978+3467=		4042+4201=		3730+4318=	
15	4795+3922=		3577+3383=		2720+2657=		4541+3963=		2910+2817=	

No	58-bosqich		59-bosqich		60-bosqich		61-bosqich		62-bosqich	
1	3230+5133=		3116+4658=		5454+2890=		5138+3372=		3471+5400=	
2	5003+3471=		4053+3914=		4202+5434=		3426+5414=		2972+5686=	
3	4299+3093=		4127+3897=		3073+5330=		5222+3172=		5694+4197=	
4	3067+5071=		2996+4772=		5442+3864=		4578+2920=		4589+4453=	
5	4046+3970=		3057+4738=		2791+3573=		3315+4574=		4692+5060=	
6	2946+4632=		3468+3354=		2834+3612=		3686+3169=		4824+4982=	
7	4062+3224=		4596+5277=		3509+4297=		4867+3055=		5250+4009=	
8	3372+4959=		4785+3794=		3176+5265=		4987+3878=		3264+4986=	
9	2899+4802=		4000+3447=		4616+3497=		4008+4545=		5439+4433=	
10	4130+3363=		4620+3890=		2996+3876=		3573+5016=		4418+4807=	
11	5237+3550=		5128+3832=		4730+3475=		2874+3755=		5076+4822=	
12	3090+4535=		3309+4322=		3823+3204=		3134+5460=		4193+4613=	
13	4270+4093=		4018+3526=		4116+4698=		3964+3737=		3789+3338=	
14	2787+2929=		2768+3431=		4079+5014=		3342+5317=		4872+4569=	
15	4374+3172=		5079+4020=		4403+3981=		3563+4904=		5708+3420=	

Qo'shuv (+) 63-72 -bosqich

No	63-bosqich		64-bosqich		65-bosqich		66-bosqich		67-bosqich	
1	3245+5625=		4822+4957=		5857+5969=		5385+4661=		3119+6167=	
2	5347+4723=		4259+5557=		4396+5127=		3830+3281=		4131+4195=	
3	3472+4690=		3985+3631=		4357+6035=		3980+4471=		5994+4025=	
4	3614+5082=		4906+4142=		4749+4287=		5038+6010=		3626+3205=	
5	4945+4478=		5488+4925=		5809+3224=		3416+3128=		3681+3389=	
6	3774+4269=		3653+3891=		3124+4178=		3994+4345=		5688+3767=	
7	4984+3757=		4684+4563=		5122+5738=		3317+5741=		4372+3830=	
8	5569+4964=		4043+5310=		4039+3020=		5864+5310=		3417+4645=	
9	4620+4904=		3016+5223=		4454+3266=		4056+5482=		5846+4348=	
10	3365+5559=		4905+3072=		3524+3001=		4577+4516=		5949+3745=	
11	3766+3007=		2990+5870=		5746+5024=		3955+4702=		5998+3698=	
12	4464+3699=		5491+4151=		5034+4371=		5259+4116=		4908+4177=	
13	4664+5743=		4825+3500=		5857+5188=		5451+3067=		6121+4874=	
14	3538+3315=		3393+5658=		5742+4584=		4287+5888=		5980+3697=	
15	5357+4940=		3354+5928=		3108+5534=		3583+6103=		4171+5050=	

No	68-bosqich		69-bosqich		70-bosqich		71-bosqich		72-bosqich	
1	3939+5616=		5897+6185=		3440+3383=		5443+4588=		5032+4008=	
2	5923+4572=		4854+4155=		5887+5974=		6437+5809=		6579+5422=	
3	5100+4352=		3843+4187=		5879+3871=		5672+3433=		3603+5114=	
4	5718+4296=		4992+5907=		4380+3682=		3942+4618=		6235+6365=	
5	5188+4622=		4419+6424=		5132+6438=		4603+5364=		5848+4560=	
6	3606+3493=		3202+5112=		3816+4082=		4694+6153=		4840+4503=	
7	3963+4512=		4666+4607=		5315+6022=		6302+5143=		6210+4588=	
8	6107+5244=		3457+4306=		4425+3415=		6314+4722=		6551+6502=	
9	4083+4325=		3433+6319=		6159+6318=		5279+6435=		4199+6600=	
10	3676+4676=		3519+4336=		5353+3284=		3595+4988=		5221+4769=	
11	4469+5049=		5472+6087=		5760+5104=		4932+4516=		3356+5632=	
12	5096+3223=		6164+6366=		6519+4634=		4353+3307=		5099+3402=	
13	5104+3176=		3874+5273=		3947+4898=		4897+3708=		4196+4903=	
14	5742+4960=		5785+4112=		6002+4020=		6495+3832=		5286+6178=	
15	4202+4034=		5710+3265=		4073+6051=		3873+5943=		6485+4729=	

Qo’shuv (+) 73-82 -bosqich

No	73-bosqich		74-bosqich		75-bosqich		76-bosqich		77-bosqich	
1	5267+5363=		5570+5034=		3536+5352=		6545+4968=		4016+5537=	
2	5245+3447=		5697+6365=		6419+4230=		3784+3553=		4700+5559=	
3	4495+4566=		3985+5102=		6230+6645=		4438+3905=		4394+5569=	
4	3830+4672=		5119+3886=		5496+3961=		6106+6466=		5315+4862=	
5	5567+6314=		6788+4973=		5205+3614=		6440+6223=		5645+4994=	
6	4445+3833=		6861+4940=		3826+4331=		4372+6586=		3911+5243=	
7	6371+3683=		5359+3838=		5264+4096=		4841+5070=		4929+5111=	
8	6304+4710=		3920+4398=		5792+4134=		3758+3591=		5462+5869=	
9	5736+3801=		4229+3564=		6230+4397=		5034+3616=		6617+3948=	
10	4973+5848=		6874+4676=		3549+6717=		7143+6132=		7015+6130=	
11	4192+4967=		4139+4829=		6847+6757=		7142+6333=		5093+5590=	
12	4257+5409=		4685+5357=		5188+6833=		4377+5087=		6724+7088=	
13	6690+3662=		6850+6500=		5497+5947=		4918+5671=		6786+4846=	
14	5087+6788=		6310+5597=		3939+4645=		6901+4438=		7192+4427=	
15	4971+4254=		4443+6496=		4950+5175=		4391+4596=		3646+7075=	

No	78-bosqich		79-bosqich		80-bosqich		81-bosqich		82-bosqich	
1	5170+3960=		5165+6319=		4084+6612=		5321+7581=		5840+6286=	
2	6448+6861=		6295+5443=		7185+7506=		4711+4957=		7387+7014=	
3	6990+4128=		3894+5264=		4685+7176=		7289+5740=		4483+4784=	
4	5915+4189=		4573+5825=		4054+5303=		6682+6296=		6363+5369=	
5	6004+3874=		7399+4435=		5885+7332=		6088+6537=		6502+5189=	
6	3911+3674=		5301+6983=		3947+6530=		5569+4326=		6146+3876=	
7	7228+4588=		5095+4274=		7408+7005=		7290+7265=		4371+6744=	
8	3999+3882=		5288+6685=		4034+6816=		5440+5790=		5279+5506=	
9	7130+4546=		5565+7228=		5929+5584=		7609+5471=		6442+5798=	
10	7128+6056=		5722+5198=		5060+5770=		7231+4537=		5155+4831=	
11	6798+5727=		4646+5227=		5166+5255=		7165+4164=		7727+6915=	
12	5722+5877=		4963+4329=		6170+5219=		7635+4431=		3921+6308=	
13	4441+6035=		6726+6829=		4264+7485=		4110+4152=		6575+5666=	
14	4699+7170=		4410+6604=		5915+7235=		4202+7355=		6809+7334=	
15	6774+5923=		5366+4187=		4627+6823=		4653+4416=		5775+5973=	

Qo'shuv (+) 83-92 -bosqich

No	83-bosqich		84-bosqich		85-bosqich		86-bosqich		87-bosqich	
1	6299+5028=		7920+5557=		7322+6206=		7191+7181=		6869+8067=	
2	4183+4644=		5648+6874=		8015+6500=		5447+5576=		4350+5566=	
3	7028+4301=		7198+7198=		5112+5457=		4997+5438=		7961+5530=	
4	4963+6655=		5657+7173=		6072+7516=		6990+8098=		7302+5479=	
5	4344+7014=		6739+5440=		6933+5895=		7382+7698=		7424+7100=	
6	5680+4417=		4521+6794=		6305+5135=		5999+7073=		5626+5738=	
7	4677+4061=		6489+7086=		6932+4522=		5155+5367=		4374+7681=	
8	6889+7012=		4545+7733=		4745+5710=		5753+6317=		8222+4232=	
9	6125+7716=		5235+7355=		6086+4053=		8001+5374=		7814+4672=	
10	5535+5425=		7068+6425=		5316+6232=		7902+6622=		5127+6354=	
11	5965+6874=		4857+6562=		6873+6214=		4933+4087=		5429+4258=	
12	7015+4850=		5230+5385=		7526+5242=		7126+8003=		8108+4832=	
13	4183+5127=		5760+4437=		6719+5646=		6622+7393=		7124+6537=	
14	7769+4099=		5114+5723=		7529+6218=		5264+4270=		4978+7149=	
15	5683+6541=		4602+4136=		6451+4647=		4601+4450=		6168+5116=	

No	88-bosqich		89-bosqich		90-bosqich		91-bosqich		92-bosqich	
1	5463+7370=		4223+8359=		7490+5910=		4998+5238=		5944+5288=	
2	6680+5073=		6501+6611=		6664+4849=		5661+6677=		8528+8558=	
3	4208+7868=		7505+8103=		8173+6313=		8501+6721=		6349+6619=	
4	4461+7944=		4283+5520=		4655+4705=		5620+5855=		6426+6242=	
5	5476+8260=		6832+4875=		716+4500=		7921+4351=		6006+7701=	
6	6790+7959=		4807+6305=		4661+5049=		6428+7725=		8021+5195=	
7	6503+7248=		7380+5760=		7262+6487=		8623+4390=		7229+6523=	
8	6949+8314=		6862+5688=		5897+4629=		5498+4796=		6504+5019=	
9	4815+6650=		7589+7124=		4337+8496=		4845+4592=		7909+5726=	
10	8229+6455=		7849+5465=		7576+6875=		4727+4558=		7502+4909=	
11	7519+4983=		6678+5895=		7407+6905=		6011+8248=		7280+4995=	
12	4829+7713=		6245+5694=		6810+4644=		4977+7739=		7852+4675=	
13	6251+6595=		4788+4818=		6007+7730=		6042+6399=		8131+6162=	
14	6074+6072=		5375+6939=		7979+7660=		4505+8186=		8139+5214=	
15	5794+6758=		7828+6952=		5467+7856=		6141+6710=		5745+5705=	

Qo'shuv (+) 93-100 -bosqich

No	93-bosqich		94-bosqich		95-bosqich		96-bosqich		97-bosqich	
1	4982+6087=		5795+7112=		5366+5504=		6278+7219=		8354+7474=	
2	6487+7214=		8802+5835=		5402+8070=		6769+5338=		6241+8197=	
3	5870+7365=		6898+5015=		8248+8625=		5477+8155=		6667+8011=	
4	6124+6197=		8559+6832=		7409+5758=		8655+5068=		6941+8533=	
5	5105+5002=		8014+5397=		6697+6374=		8119+5979=		9007+5933=	
6	4545+5965=		6105+8194=		6556+7823=		8517+4942=		5952+7420=	
7	8032+7865=		4681+4865=		6056+6575=		8554+6990=		7806+4957=	
8	5051+4755=		5629+5318=		8166+7587=		7927+8991=		9029+7988=	
9	4686+6333=		5172+6956=		6559+5781=		7589+8417=		8504+7138=	
10	7912+8629=		8271+8036=		8841+5592=		4754+7232=		8168+5929=	
11	8268+5858=		7820+6565=		4819+5015=		6849+7902=		6240+5280=	
12	5447+6196=		7984+6964=		6220+5714=		8775+5868=		7407+5100=	
13	5476+5533=		4623+5094=		6646+5514=		8106+4562=		5944+5600=	
14	6554+6441=		6721+4482=		6269+8630=		7258+8259=		4962+5932=	
15	6028+8253=		5326+6306=		8746+5122=		8861+8814=		5666+8390=	

No	98-bosqich		99-bosqich		100-bosqich					
1	5104+6431=		5327+7084=		5287+7124=		7255+6140=		7839+9038=	
2	4869+6574=		5923+5145=		5514+8769=		8716+5533=		8784+6582=	
3	8715+5397=		6382+7298=		8182+7949=		8486+6480=		8357+7480=	
4	5374+8863=		8534+7680=		6458+4849=		7473+9413=		8774+7723=	
5	7596+9323=		6874+7641=		5504+5328=		7674+9427=		6009+6079=	
6	5110+6157=		5714+6025=		8133+8739=		7769+7162=		8524+6663=	
7	6282+6022=		8682+5828=		7295+6246=		7003+5858=		7760+8987=	
8	8643+9244=		8839+9176=		7470+8204=		6148+5314=		7934+4750=	
9	8152+7145=		6709+6794=		8084+4782=		6359+7219=		9362+4886=	
10	8490+8667=		4893+8474=		6078+9161=		5007+5203=		8712+5182=	
11	8878+8917=		5892+4881=		5683+5033=		5312+7208=		9296+7459=	
12	5862+9120=		9052+8146=		6732+9535=		9501+5372=		5474+6255=	
13	7982+8427=		7038+7512=		9237+7698=		5066+5809=		8952+4890=	
14	8349+7574=		6492+8750=		5322+5136=		8243+6439=		5638+9425=	
15	6859+5569=		8112+6032=		7401+4880=		7680+8292=		6279+6412=	

AYIRUV

Do'stlarning eng yaxshisi :

Senda biror yaxshilik ko'rsa, uni tarqatadi,

Senda biror yomonlik ko'rsa, uni yashiradi.

Senga dunyo kulib boqsa, hasad qilmaydi.

Bordi-yu dunyo sendan yuz o'girsa, seni tashlab ketmaydi.

YAXLITLASH

Yaxlitlash usulida bir-biridan ayirish qiyin bo'lgan sonlarni ayirish oson bo'lgan sonlarga aylantiriladi.

Ayirish qoidasi

Bunda yaxlitlash bir-xil tomonga bo'ladi. Ya'ni, yaxlitlangan son qo'shish orqali bo'lgan bo'lsa, → natijaga ham huddi shuncha qo'shamiz, agar ayirish orqali bo'lgan bo'lsa → natijadan ham xuddi shuncha ayiramiz.

$$\frac{Y_1}{X_1} \quad Y_1 \xrightarrow{+} Y_2, \quad X_1 \xrightarrow{+} X_2$$

Eslatma : ayirish usulida faqat ayirilgan son (bizning misolimizda 155)ni yahlitlash mumkin

Masalan (1) :

$$263 - 155 = 108$$

$$\begin{array}{r} 263 \\ -\ 150 \\ \hline 113 \\ -\ 5 \\ \hline 108 \end{array}$$

1) Bizga 155 noqulay son bo'lgani uchun 155 dan **5** ni ayirib 150 qilib olamiz : 155 – **5** = **150**

2) 263 – 150 = 113

3) Endi ayirishdagi qoidamizga asoslanib, chiqqan son 113 dan biz ayirgan **5** ni yana ayiramiz.

4) 113 – 5 = **108**

Masalan (2) :

$$334 - 188 = 146$$

$$\begin{array}{r} 334 \\ -\,200 \\ \hline 134 \\ +\,12 \\ \hline 146 \end{array}$$

1) Bizga 188 noqulay son bo'lgani uchun 188 ga **12** ni qo'shib, 200 qilib olamiz : 188 + **12** = 200

2) 334 + 200 = 134

3) Endi qo'shishdagi qoidamizga asoslanib, chiqqan son 134 ga biz oldin qo'shgan **12** ni yana qo'shamiz.

4) 134 + 12 = **146**

Kaktus o'simligidan senga olma berishini kutma. Narsalarning aslini va o'tmishini bilishga intil, kelajakda ulardan senga zarar yetmasin.

Video tushuntirish

YouTube : Kimyo uchun Matematika "Ayirishda yahlitlash 1,2-misol"

Ayiruv (-) 1-12 -bosqich

No	1-bosqich		2-bosqich		3-bosqich		4-bosqich		5-bosqich		6-bosqich	
1	11-4=		25-21=		35-32=		86-41=		99-49=		75-40=	
2	21-10=		30-21=		42-17=		69-22=		104-47=		101-27=	
3	21-9=		40-8=		54-12=		72-32=		84-36=		149-49=	
4	13-9=		42-15=		63-29=		64-37=		76-45=		97-45=	
5	10-5=		34-16=		58-23=		76-23=		51-30=		147-57=	
6	21-4=		17-13=		55-29=		68-25=		48-45=		88-66=	
7	16-10=		36-12=		55-18=		39-19=		47-43=		69-50=	
8	9-9=		23-8=		50-19=		73-34=		48-41=		107-30=	
9	20-4=		39-15=		39-19=		87-29=		80-51=		53-27=	
10	14-6=		41-18=		40-31=		64-41=		59-46=		80-29=	
11	9-8=		28-19=		50-27=		44-36=		60-20=		97-26=	
12	15-6=		18-14=		40-21=		52-32=		94-36=		91-51=	
13	20-4=		41-16=		48-24=		33-32=		70-35=		124-59=	
14	21-6=		38-11=		61-21=		80-20=		79-26=		70-58=	
15	11-6=		19-18=		63-28=		71-39=		82-54=		119-35=	

No	7-bosqich		8-bosqich		9-bosqich		10-bosqich		11-bosqich		12-bosqich	
1	196-91=		305-92=		246-159=		344-273=		455-180=		373-316=	
2	110-56=		276-158=		408-192=		483-229=		424-221=		635-268=	
3	153-109=		200-174=		405-145=		327-144=		621-224=		470-201=	
4	183-95=		250-174=		429-223=		259-165=		348-238=		587-197=	
5	231-88=		174-154=		409-213=		421-174=		563-202=		400-328=	
6	184-56=		207-162=		263-157=		345-243=		486-218=		701-276=	
7	184-62=		337-156=		344-199=		313-196=		559-193=		627-220=	
8	126-77=		176-118=		349-197=		385-194=		431-217=		686-278=	
9	193-110=		264-97=		364-179=		542-190=		500-184=		733-234=	
10	125-87=		286-134=		303-206=		380-255=		516-305=		599-215=	
11	166-70=		211-169=		344-224=		351-136=		415-207=		360-211=	
12	229-59=		184-128=		232-188=		259-125=		349-275=		372-189=	
13	211-84=		317-113=		373-220=		475-176=		322-274=		555-354=	
14	194-62=		268-163=		304-184=		426-141=		621-218=		374-327=	
15	128-98=		190-164=		240-183=		422-128=		304-262=		677-331=	

Ayiruv (-) 13-22 -bosqich

No	13-bosqich		14-bosqich		15-bosqich		16-bosqich		17-bosqich	
1	428-344=		614-422=		878-308=		650-313=		731-609=	
2	409-206=		894-344=		782-501=		804-471=		1236-333=	
3	676-396=		669-226=		944-442=		996-387=		994-392=	
4	655-364=		836-459=		643-338=		928-560=		1034-429=	
5	697-322=		798-286=		992-431=		1000-289=		1077-561=	
6	799-288=		820-447=		507-481=		698-405=		1083-373=	
7	725-293=		606-242=		816-508=		763-391=		722-470=	
8	776-346=		645-232=		812-283=		739-431=		800-560=	
9	450-220=		936-429=		674-360=		1077-305=		781-543=	
10	682-297=		784-353=		587-259=		883-491=		962-611=	
11	708-252=		794-286=		745-465=		1018-338=		734-484=	
12	640-332=		740-319=		805-486=		686-337=		1170-429=	
13	846-395=		826-293=		910-500=		1056-471=		629-463=	
14	460-294=		486-320=		555-375=		1147-457=		864-581=	
15	536-269=		616-271=		939-505=		799-504=		743-443=	

No	18-bosqich		19-bosqich		20-bosqich		21-bosqich		22-bosqich	
1	918-325=		896-498=		1410-757=		1342-659=		1418-602=	
2	792-443=		934-478=		1054-444=		980-671=		1028-718=	
3	725-642=		1318-419=		1502-688=		1409-578=		1039-690=	
4	844-484=		1368-609=		1360-494=		1581-692=		953-752=	
5	709-459=		1029-644=		995-502=		1219-548=		879-504=	
6	720-615=		842-711=		878-453=		1588-526=		1571-775=	
7	706-355=		888-522=		1294-642=		1047-567=		1404-584=	
8	779-395=		1435-518=		1518-583=		1146-715=		1578-594=	
9	1091-608=		822-526=		1235-605=		1474-581=		1137-595=	
10	823-379=		1216-692=		1501-655=		1294-559=		1712-541=	
11	892-386=		1048-388=		1515-607=		1299-655=		862-656=	
12	818-573=		1171-374=		1465-495=		1121-679=		990-795=	
13	1046-579=		1388-697=		1453-413=		1029-561=		1601-464=	
14	866-394=		1389-362=		1173-618=		1336-743=		1328-732=	
15	741-579=		1081-511=		1541-654=		1253-454=		1503-835=	

Ayiruv (-) 23-32 -bosqich

No	23-bosqich		24-bosqich		25-bosqich		26-bosqich		27-bosqich	
1	1078-528=		1225-584=		1296-629=		1225-986=		2009-970=	
2	1556-848=		1708-854=		1347-831=		1060-890=		1970-1053=	
3	1197-555=		1894-705=		1192-514=		1732-622=		1693-657=	
4	1080-464=		1566-947=		1426-853=		2100-930=		1122-1034=	
5	1295-772=		1574-563=		1145-584=		1112-1050=		1728-971=	
6	1064-526=		1670-972=		1710-720=		1270-779=		1292-822=	
7	1752-881=		1665-722=		1185-809=		1890-882=		1340-1096=	
8	1245-899=		957-576=		1460-957=		1129-1040=		1670-1085=	
9	1328-589=		1301-659=		1133-824=		1193-728=		1292-619=	
10	1070-715=		1723-905=		1704-728=		2068-1023=		1948-853=	
11	1686-577=		1431-756=		1358-790=		2003-1036=		1698-841=	
12	982-558=		1630-863=		1416-573=		1747-955=		1706-675=	
13	1375-835=		1720-947=		1200-582=		1640-617=		1536-595=	
14	1132-651=		1389-638=		1368-938=		1398-832=		1468-1047=	
15	981-507=		1373-685=		1692-626=		1465-795=		1675-836=	

No	28-bosqich		29-bosqich		30-bosqich		31-bosqich		32-bosqich	
1	1770-1035=		1664-947=		1782-643=		1382-867=		2212-924=	
2	1769-920=		1987-653=		1291-1051=		2642-694=		2139-1287=	
3	2187-618=		2081-1077=		1996-1056=		1687-1214=		1610-1058=	
4	1840-1149=		1326-1148=		2424-727=		2422-928=		1392-994=	
5	2261-856=		1918-1109=		2145-1123=		2446-864=		2555-723=	
6	2101-1131=		1357-1141=		1626-785=		2357-726=		1643-1315=	
7	1710-681=		2338-933=		1647-1105=		2518-1188=		1645-1252=	
8	1291-863=		2307-883=		2442-990=		2399-951=		2121-891=	
9	1173-1082=		1823-1187=		1769-1174=		1938-1265=		1402-955=	
10	2059-1143=		1504-1040=		1903-834=		1957-727=		2704-701=	
11	1242-1009=		1362-1180=		1632-769=		2621-1102=		2080-1039=	
12	1307-982=		2100-1051=		2081-697=		1625-756=		2357-997=	
13	1641-921=		1376-1155=		2349-1015=		1413-1270=		2618-891=	
14	1262-1003=		1290-1121=		1666-815=		2042-732=		2585-881=	
15	2279-977=		1824-670=		1256-755=		2142-710=		1367-1111=	

Ayiruv (-) 33-42 -bosqich

No	33-bosqich		34-bosqich		35-bosqich		36-bosqich		37-bosqich	
1	1886-1363=		2104-771=		1673-1318=		2016-1401=		3130-1584=	
2	1882-1101=		2766-1175=		2496-1387=		1890-830=		3029-995=	
3	2132-1278=		1498-1305=		2727-1191=		2678-1257=		1709-1128=	
4	2743-1377=		2837-1321=		2701-1284=		2184-1454=		2752-1518=	
5	2076-1012=		2441-884=		2773-1446=		3113-1309=		3206-1161=	
6	2238-1098=		1559-776=		2511-793=		2123-851=		1730-1489=	
7	1699-978=		2356-1229=		1755-940=		1979-888=		1861-1070=	
8	1635-1131=		1875-1372=		1553-1078=		2775-1554=		2595-1091=	
9	2451-1381=		1574-1441=		2483-847=		1649-1204=		3195-1334=	
10	1705-900=		2771-1145=		2313-823=		1948-1352=		2544-1161=	
11	1828-1135=		2160-1084=		2577-1114=		1736-1242=		2578-1170=	
12	1618-1408=		2555-1021=		2281-791=		3014-1456=		2500-902=	
13	2756-1115=		1641-859=		2934-955=		1950-780=		1648-1500=	
14	2540-1407=		1928-1364=		2382-1486=		1720-1424=		1686-1524=	
15	2776-756=		1551-1367=		2372-968=		3060-1085=		2441-1077=	

No	38-bosqich		39-bosqich		40-bosqich		41-bosqich		42-bosqich	
1	2696-1056=		2482-1633=		3514-1217=		3352-1792=		2198-1453=	
2	3322-1103=		3378-979=		2299-1594=		1825-1687=		1951-1273=	
3	1665-852=		2445-1631=		2184-1573=		2854-1196=		2433-1850=	
4	1660-1257=		2608-1382=		3256-1031=		2635-1478=		2111-1784=	
5	3060-1445=		2712-1593=		2981-1739=		2822-1215=		2492-1050=	
6	3149-1047=		3424-1422=		3123-1658=		2245-994=		2657-1214=	
7	2026-1034=		2586-1234=		1943-1753=		2023-1726=		3084-1681=	
8	2805-1128=		2102-1624=		3443-1603=		2768-1396=		3716-1657=	
9	3110-954=		2886-911=		3345-1037=		2159-1592=		3224-1767=	
10	2977-1631=		1781-1083=		1813-1264=		2353-1095=		3342-1863=	
11	1773-1399=		2124-1551=		2847-1213=		1875-1573=		1935-1625=	
12	2606-1552=		3362-1309=		3478-1760=		2249-1800=		3189-1541=	
13	2317-958=		2256-880=		2472-903=		3017-1096=		3066-1530=	
14	3064-1312=		3107-1012=		1766-1584=		2335-932=		3181-1241=	
15	2279-1146=		2542-1388=		2030-1312=		3258-1670=		3615-1814=	

Ayiruv (-) 43-52 -bosqich

No	43-bosqich		44-bosqich		45-bosqich		46-bosqich		47-bosqich	
1	2396-954=		2361-1801=		2505-2011=		2561-1707=		2575-1485=	
2	2847-1212=		3357-1330=		2676-1722=		4148-1807=		2853-1108=	
3	2511-1240=		3104-1714=		2456-1808=		3094-1238=		4046-1268=	
4	2529-1507=		2823-1097=		3526-1911=		4106-1494=		4065-1263=	
5	3518-1234=		3098-1308=		3558-1718=		2912-1229=		2378-1633=	
6	2194-1438=		2187-1763=		2173-1295=		3134-1583=		3477-1501=	
7	3626-1118=		2312-1856=		2092-1823=		3168-1967=		3039-1878=	
8	2928-1717=		3276-1800=		2305-1298=		3546-1695=		2590-1906=	
9	2249-1585=		2971-1253=		3039-1650=		3943-1856=		2360-2032=	
10	2943-1906=		3831-1402=		3327-1459=		3157-1420=		2572-1990=	
11	2352-1511=		3534-1058=		2457-1750=		3956-1484=		4212-1907=	
12	3520-1386=		3555-1090=		3001-1175=		2804-1731=		4107-1231=	
13	2684-1785=		3017-1751=		3252-1217=		4034-1609=		3460-1869=	
14	2388-1437=		3435-1005=		2059-1408=		2432-1643=		3169-2030=	
15	1950-1877=		3846-1960=		2314-1461=		4103-1079=		3985-1474=	

No	48-bosqich		49-bosqich		50-bosqich		51-bosqich		52-bosqich	
1	2854-1269=		3625-1656=		3825-2186=		4185-1165=		2545-2255=	
2	2389-1155=		2532-1533=		3895-1458=		3095-1515=		4193-1407=	
3	4266-2069=		2364-2158=		3696-1763=		3869-1741=		4375-1644=	
4	2777-1796=		3065-1990=		3856-2196=		4481-2011=		2639-1603=	
5	3232-1915=		4295-1998=		2332-1437=		4274-1638=		3144-2095=	
6	2295-1381=		3923-1466=		3963-1148=		3951-1572=		3836-1810=	
7	2906-1311=		2285-1639=		4265-1940=		2367-1658=		2895-2333=	
8	4034-2039=		3894-1724=		4511-2140=		4406-1986=		4369-1343=	
9	2584-1295=		3830-1399=		2745-2219=		4619-2018=		3502-2067=	
10	3251-1909=		4392-2220=		3028-1252=		2343-2080=		2361-2015=	
11	3135-1720=		3481-1810=		4121-1200=		2464-1995=		4381-1818=	
12	3136-1114=		3430-2185=		2492-1627=		4134-1780=		4154-2087=	
13	3956-1809=		2699-1219=		2586-1677=		4099-1342=		3934-1313=	
14	3110-1432=		2983-2150=		2615-2177=		2520-1474=		4405-2044=	
15	2799-2119=		3790-1624=		4542-1261=		4165-1778=		2598-1879=	

Ayiruv (-) 53-62 -bosqich

No	53-bosqich		54-bosqich		55-bosqich		56-bosqich		57-bosqich	
1	3218-2120=		2788-2257=		2587-1888=		4108-2528=		5212-2315=	
2	2969-1913=		4249-1254=		2520-1919=		4607-1585=		4448-1826=	
3	3477-1319=		3210-2139=		4799-1414=		4344-2360=		3830-1582=	
4	3309-1410=		2469-1374=		3743-1412=		4483-1488=		2986-2187=	
5	2997-1732=		2601-1776=		4996-1341=		2588-1862=		3626-1836=	
6	2585-2357=		2846-2063=		3498-1900=		5073-2311=		4692-1655=	
7	2856-1466=		2745-2071=		3442-1897=		4461-2141=		2828-1913=	
8	4756-1976=		3461-1358=		2652-2224=		4311-2541=		4538-1696=	
9	3981-2072=		3778-1492=		3074-2394=		4958-2486=		4389-1981=	
10	4579-1679=		3440-2312=		2725-1895=		4336-1543=		4175-1390=	
11	2521-1712=		4125-2294=		4447-2341=		3158-1834=		4772-1441=	
12	3791-1674=		3827-1573=		3130-2272=		5102-2281=		2604-2262=	
13	3263-1215=		3409-1607=		4406-1451=		3714-2148=		3020-1906=	
14	4387-2139=		4012-2200=		3080-2331=		4253-2001=		5064-1374=	
15	3404-1548=		4490-1641=		4619-1582=		4919-1796=		3237-1458=	

No	58-bosqich		59-bosqich		60-bosqich		61-bosqich		62-bosqich	
1	4922-2148=		5387-1990=		5466-2497=		3514-2225=		4366-2151=	
2	4488-2116=		4796-2105=		4519-2356=		3087-2276=		5700-2849=	
3	3692-2497=		4593-2207=		3373-1983=		2957-2807=		3580-2368=	
4	4825-1637=		3844-1488=		3008-2503=		5166-2812=		4485-2818=	
5	3783-2234=		4814-2225=		5514-2201=		3102-2447=		4303-1964=	
6	3038-2474=		4339-2034=		5163-1909=		3849-2130=		5080-1687=	
7	4031-2231=		5121-1719=		4710-2487=		3331-1966=		3476-2289=	
8	4517-2287=		3667-2029=		4079-2396=		5249-1671=		4378-1783=	
9	3278-1559=		3023-1792=		5518-1810=		3167-1723=		4236-1487=	
10	3114-1968=		3408-2421=		5263-2010=		3961-2785=		5379-1698=	
11	4549-2511=		4746-1547=		5350-1806=		5604-1517=		5284-1563=	
12	4910-1993=		4578-1712=		3801-1783=		3087-1666=		3454-2446=	
13	2933-1819=		4646-1721=		5072-1915=		3314-2461=		3610-1744=	
14	2695-2651=		3949-1469=		5479-2512=		4027-1885=		4554-1676=	
15	3604-1666=		4887-1984=		3767-2773=		5309-2528=		3916-2450=	

Ayiruv (-) 63-72 -bosqich

No	63-bosqich		64-bosqich		65-bosqich		66-bosqich		67-bosqich	
1	4285-2600=		4250-2138=		5071-1721=		5728-2437=		5158-1736=	
2	2926-1659=		4391-2325=		4111-1859=		5044-2883=		4461-2982=	
3	2955-1914=		4982-2227=		4712-1599=		5138-2993=		3563-2536=	
4	3513-2341=		5001-1989=		5044-2627=		3549-2976=		4713-2001=	
5	4069-1955=		3454-2031=		3487-1525=		5658-2733=		3850-2118=	
6	4753-1906=		4884-2707=		6037-1967=		4777-2884=		4367-2795=	
7	3443-2216=		5102-2275=		3270-2963=		5416-2313=		5800-2716=	
8	4425-1883=		2984-1776=		5425-1581=		3458-2685=		5873-1739=	
9	3916-2795=		5458-2373=		4909-1553=		4454-2073=		5213-2357=	
10	4553-2530=		5638-2780=		4740-2240=		4634-1570=		4040-2740=	
11	5798-2804=		3998-2607=		4729-1617=		4783-2340=		5401-1925=	
12	3091-1782=		5557-1865=		5180-2055=		3243-2243=		3551-2868=	
13	5503-1686=		3535-1750=		3018-2377=		4627-2273=		4480-1647=	
14	3191-1539=		4284-2021=		5408-2358=		4661-1889=		5474-1732=	
15	3858-1976=		4801-1709=		5826-1774=		3492-1783=		5581-1726=	

No	68-bosqich		69-bosqich		70-bosqich		71-bosqich		72-bosqich	
1	3173-2747=		5935-1843=		6108-2797=		6581-2534=		5219-2769=	
2	6019-1659=		5426-2477=		6503-3154=		3476-2598=		4117-3232=	
3	4269-1768=		4211-3087=		5518-2904=		4679-2379=		5258-2345=	
4	5160-2478=		6391-2818=		3330-1767=		3308-1664=		3828-2227=	
5	3541-2615=		4453-2522=		4667-2364=		4205-3256=		3640-3194=	
6	6272-2388=		4227-1912=		6077-2750=		4116-2505=		6404-3065=	
7	5779-2039=		4840-2594=		4058-2337=		4479-2251=		4743-2320=	
8	3300-1886=		4748-2514=		4604-2968=		3583-1864=		4922-3034=	
9	3930-2156=		5101-3091=		5521-2261=		5359-3178=		5881-2306=	
10	5401-2718=		3351-2459=		5204-2774=		6383-2306=		1632-3154=	
11	4311-1759=		5749-2146=		6039-1982=		5373-2598=		4732-2063=	
12	5722-2708=		4492-1941=		3257-2997=		4126-2676=		3899-3162=	
13	5708-2489=		3458-1842=		6187-3027=		5917-2586=		4132-2302=	
14	3431-2443=		4997-2606=		5429-1875=		6336-2971=		5536-2081=	
15	5529-2960=		4114-3014=		5218-2659=		6527-2293=		4490-1793=	

Ayiruv (-) 73-82 -bosqich

No	73-bosqich		74-bosqich		75-bosqich		76-bosqich		77-bosqich	
1	5062-3171=		4868-2969=		5876-2224=		5386-3049=		5124-3033=	
2	6733-2453=		6803-3344=		3860-2687=		5114-2763=		6477-1959=	
3	3690-1922=		5764-2151=		4845-2993=		4289-2001=		5198-2503=	
4	3401-1895=		4683-2536=		5932-3383=		3981-1911=		3973-2016=	
5	6221-2364=		6786-3133=		3971-2366=		4582-3344=		4556-2871=	
6	4615-2552=		4072-2608=		4207-2296=		6892-2257=		6592-2760=	
7	4598-2661=		4057-1835=		5351-3331=		6746-2258=		5487-2489=	
8	5377-3306=		6239-1800=		5339-2061=		6176-1856=		7157-2238=	
9	6610-2520=		5537-3033=		5700-2742=		5007-2233=		7110-2791=	
10	4351-3108=		4999-2454=		4428-2433=		6284-2675=		4421-3193=	
11	4237-2372=		3804-1977=		5595-3024=		5451-2611=		6472-2209=	
12	4489-2707=		6476-2801=		5761-3107=		6603-2877=		6072-2655=	
13	5136-1868=		5015-1814=		4365-3303=		4265-2202=		7081-2785=	
14	5349-2149=		4033-1942=		4272-2345=		6375-2496=		7062-2968=	
15	5634-2093=		3764-3188=		4725-3384=		5496-2387=		6167-2091=	

No	78-bosqich		79-bosqich		80-bosqich		81-bosqich		82-bosqich	
1	4777-2361=		5149-2239=		7534-3394=		7239-3129=		5543-3348=	
2	4830-3614=		6613-2876=		4613-2560=		6459-2651=		6582-3796=	
3	6518-3412=		5268-2001=		6697-3768=		6367-3801=		4806-3252=	
4	5693-2189=		6849-2328=		5461-2968=		6659-2945=		6314-2200=	
5	4870-2715=		7355-2732=		4694-2432=		5240-3449=		5391-3298=	
6	6255-3370=		4416-3169=		7109-2981=		3846-2078=		7394-2283=	
7	6660-1959=		6945-3006=		3846-3773=		5269-1915=		4127-2969=	
8	4388-3523=		6052-3249=		4772-3238=		6138-3746=		6974-3124=	
9	7018-3518=		4640-3385=		5550-2217=		4673-2270=		4544-3636=	
10	5222-2128=		4044-2008=		5259-3377=		7166-2032=		6248-3376=	
11	4602-2076=		5305-2015=		7347-3635=		5498-2873=		6701-1954=	
12	5674-2043=		6697-2418=		6012-2873=		5249-1932=		7601-3500=	
13	5474-3060=		6779-2998=		7432-3101=		3980-2151=		7466-3591=	
14	4090-3184=		6580-3044=		5865-3371=		4075-2471=		5001-3512=	
15	5855-3241=		6240-1902=		5281-1998=		6433-2810=		5262-2612=	

Ayiruv (-) 83-92 -bosqich

No	83-bosqich		84-bosqich		85-bosqich		86-bosqich		87-bosqich	
1	4185-2157=		6091-3079=		7231-3806=		7297-2904=		4142-3138=	
2	5380-2986=		5079-2727=		7090-2447=		4063-2392=		6902-3290=	
3	4950-2306=		7871-2629=		4312-3967=		4998-3660=		5131-3388=	
4	6234-3072=		5903-3531=		7760-3711=		7722-2043=		4678-2188=	
5	4306-2632=		6418-2596=		4833-2996=		7489-3588=		5710-2690=	
6	7731-2436=		5331-2462=		7451-2019=		7574-3148=		4638-2765=	
7	7749-1987=		7086-2268=		6902-2176=		7741-2916=		6726-2473=	
8	4253-2549=		4346-2181=		5762-3663=		6571-3660=		7868-3650=	
9	5158-3411=		5508-2482=		5674-2681=		6230-2549=		6362-2326=	
10	4877-3506=		5458-3342=		7338-3935=		5188-3581=		7545-3897=	
11	4040-3164=		5422-3529=		7193-2897=		4883-3579=		5082-2141=	
12	4353-3093=		5615-2526=		4275-3201=		5400-2600=		6862-3499=	
13	5986-3522=		6154-3673=		6619-3563=		5579-3040=		6744-2462=	
14	5391-2316=		5500-3690=		7172-3718=		7734-2174=		6792-2285=	
15	4570-3761=		6642-3547=		5004-3418=		5363-3882=		4489-2308=	

No	88-bosqich		89-bosqich		90-bosqich		91-bosqich		92-bosqich	
1	7662-2547=		5460-2630=		6769-2958=		5509-3734=		5490-2355=	
2	4891-2265=		4648-2805=		8274-3813=		6759-3908=		7385-2753=	
3	6447-2990=		5361-2277=		6712-3893=		6048-2859=		5543-3872=	
4	7992-2467=		7531-3014=		7277-3783=		6540-2332=		5026-3620=	
5	6232-3460=		4891-2706=		7199-2684=		4464-2394=		7447-3495=	
6	5193-3040=		6131-2448=		8121-2439=		5693-3115=		5445-3992=	
7	4829-3273=		7868-3578=		7966-2931=		7643-3428=		7235-3131=	
8	6199-3672=		5344-2429=		5113-4265=		5692-3173=		8492-2196=	
9	7050-3906=		4464-2506=		5053-2594=		8206-4078=		5479-2755=	
10	6438-2833=		5756-2542=		8262-3172=		7033-4245=		5242-4009=	
11	4848-3863=		5285-2320=		6877-2938=		5333-4261=		4422-2944=	
12	5520-3925=		5977-2421=		5030-3699=		4433-3874=		7002-4238=	
13	5095-2539=		5524-2141=		4613-3510=		6853-3622=		8070-4105=	
14	6550-2980=		4202-2764=		8419-2167=		7496-2221=		6383-2722=	
15	4814-3256=		4933-3371=		6836-3482=		4396-4317=		8357-2441=	

Ayiruv (-) 93-100 -bosqich

No	93-bosqich		94-bosqich		95-bosqich		96-bosqich		97-bosqich	
1	4680-3783=		6925-2611=		5174-3724=		6784-3660=		6667-2704=	
2	8795-4189=		6245-3444=		8908-3846=		6382-3122=		7324-2353=	
3	7698-3725=		4860-2729=		6730-2800=		7388-2760=		8658-4372=	
4	5653-3453=		8686-2876=		4803-4157=		6342-4352=		7369-3519=	
5	6766-3209=		7825-3672=		6527-3054=		6470-4421=		6748-3174=	
6	6169-3498=		7938-4193=		6912-3713=		7980-3501=		6131-4586=	
7	8633-3190=		5866-3507=		4935-2375=		6666-3517=		5597-4488=	
8	5325-4139=		6978-3606=		7482-4063=		7407-2959=		5396-3892=	
9	7739-3392=		8031-4440=		7873-2580=		4825-3642=		5185-4317=	
10	5260-3817=		8938-2629=		8653-2591=		7963-3351=		6679-2885=	
11	5964-2679=		6238-2818=		8592-3126=		8554-2886=		7536-2540=	
12	4888-3044=		7772-4426=		4724-2867=		8084-2743=		7865-2402=	
13	4811-2504=		6929-3370=		8180-3398=		5657-4218=		8474-4145=	
14	5140-3083=		8184-3298=		8939-3043=		8494-3162=		5040-3680=	
15	4472-3224=		8474-2793=		7187-2514=		6093-4063=		7885-4075=	

No	98-bosqich		99-bosqich		100-bosqich					
1	6132-4103=		8807-3415=		6172-4148=		8834-3400=		8148-3169=	
2	7752-4136=		9271-2518=		5583-4469=		6838-2713=		8831-3464=	
3	7194-3913=		7600-4674=		5949-3990=		9209-3046=		6654-3886=	
4	5348-3482=		5995-4449=		5023-2582=		7680-3873=		4868-4117=	
5	6683-3230=		9144-4305=		9374-2561=		7066-2597=		7899-4400=	
6	6200-4086=		7914-3589=		5249-3677=		5714-4480=		7081-4612=	
7	6985-2383=		7396-2976=		6840-4077=		4767-3904=		4891-2746=	
8	5229-3720=		5763-4593=		5882-4148=		5542-4702=		4907-3876=	
9	6137-4269=		4793-3203=		7792-4315=		6445-2806=		7963-2595=	
10	5290-4620=		7034-4308=		8620-4299=		7843-3167=		8974-4234=	
11	6971-3762=		8189-4252=		4816-4478=		7370-3157=		7466-4659=	
12	6533-4297=		6366-3314=		4838-4516=		9042-4197=		7102-3071=	
13	5644-2594=		5800-4598=		7584-3883=		6185-4270=		9208-4080=	
14	8006-3110=		8588-3002=		7093-3238=		9377-4171=		7946-2972=	
15	7970-4170=		8586-4504=		6459-4150=		6403-3748=		8405-4578=	

PROPORSIYA

Jismning rohati oz ovqatlanishda.
Nafsning rohati gunohni ozaytirishda.
Qalbning rohati e'tiborning ozligida.
Tilning rohati oz gapirishda.

(Ali inb Abu Tolib)

Nisbat olish qoydasi.

Proporsiyada ham gorizontal, ham vertikal tomonlama sonlar nisbati bir xil bo'ladi.

Masalan :

$$12 \text{ ——— } 36$$
$$24 \text{ ——— } x = 72$$

1) 12 soni 24 dan 2 barobar kichik bo'lgani uchun ...

2) 36 ni 2 ga ko'paytiramiz.

$$1 \leftarrow \cancel{12} \text{ ——— } 36$$
$$2 \leftarrow \cancel{24} \text{ ——— } x = 36 \cdot 2 = 72$$

Yoki :

1) 12 soni 36 dan 3 barobar kichik bo'lgani uchun ...

2) 24 ni 3 ga ko'paytiramiz.

$$\begin{matrix} 1 & & 3 \\ \uparrow & & \uparrow \\ \cancel{12} & \text{———} & \cancel{36} \\ 24 & \text{———} & x = 24 \cdot 3 = 72 \end{matrix}$$

Video tushuntirish — **YouTube** : Kimyo uchun Matematika "Proporsiya"

Praporsiya 1-4 bosqich

No	1-bosqich	2-bosqich	3-bosqich	4-bosqich
1	14 —— 5 28 —— x =	15 —— 45 4 —— x =	22,4 —— 0,4 11,2 —— x =	67,2 —— 0,3 44,8 —— x =
2	15 —— 7 75 —— x =	17 —— 68 28 —— x =	67,2 —— 25 3,36 —— x =	44,8 —— 64 10,08 —— x =
3	4 —— 13 36 —— x =	140 —— 35 32 —— x =	45 —— 5 11,25 —— x =	25,25 —— 202 1,25 —— x =
4	18 —— 5 72 —— x =	12 —— 36 22 —— x =	188 —— 0,25 150,4 —— x =	142 —— 0,8 17,75 —— x =
5	2 —— 8 18 —— x =	112 —— 14 64 —— x =	65 —— 192 8,125 —— x =	125 —— 250 3,5 —— x =
6	33 —— 6 11 —— x =	24 —— 168 9 —— x =	98 —— 122,5 24,5 —— x =	12 —— 96 24,5 —— x =
7	12 —— 7 60 —— x =	63 —— 21 18 —— x =	28 —— 44 3,5 —— x =	13 —— 117 3,5 —— x =
8	17 —— 5 51 —— x =	19 —— 171 11 —— x =	55 —— 125 33 —— x =	25 —— 125 33 —— x =
9	24 —— 8 6 —— x =	100 —— 15 28 —— x =	112 —— 2,5 2,24 —— x =	24 —— 4,8 1,12 —— x =
10	33 —— 7 100 —— x =	120 —— 18 44 —— x =	456 —— 684 28 —— x =	266 —— 33,25 28 —— x =
11	19 —— 5 114 —— x =	19 —— 114 15 —— x =	125 —— 1000 80 —— x =	64 —— 0,8 80 —— x =
12	16 —— 6 40 —— x =	30 —— 75 16 —— x =	90 —— 54 22,4 —— x =	256 —— 1024 22,4 —— x =
13	13 —— 5 52 —— x =	27 —— 10,8 60 —— x =	86 —— 344 1,5 —— x =	8 —— 108 1,5 —— x =
14	37 —— 11 185 —— x =	13 —— 78 10 —— x =	85,5 —— 513 65 —— x =	9,5 —— 142,5 60 —— x =
15	140 —— 1 126 —— x =	140 —— 7 360 —— x =	650 —— 100 520 —— x =	13 —— 200 110,5 —— x =
16	175 —— 6 70 —— x =	155 —— 62 25 —— x =	188 —— 54 18,8 —— x =	62,5 —— 12,5 10 —— x =
17	12 —— 13 96 —— x =	19 —— 152 11 —— x =	90 —— 108 27 —— x =	177 —— 29,5 27 —— x =
18	26 —— 25 182 —— x =	38 —— 266 72 —— x =	65 —— 52 26 —— x =	92 —— 11,5 26 —— x =

AVOGADRO

Bir donishmanddan so'radilar : "Insondagi eng hayratlanarli narsa nima ?"

Shunda u javob berdi :

"Insonlar bolaliklaridan zerikishadi-da, katta bo'lishni orzu qilishadi, keyin katta bo'lishganida yana bolalikni orzu qilishadi.

Mol-u dunyo to'plash uchun sog'liqlarini ketkazishadi-da, so'ngra sog'liqlarini qayta tiklash uchun uni sarf qilishadi.

Kelajakni o'ylab xavotirga tushishadi-yu, hozirlarini unutishadi, shunday qilib, ular na hozirgi, na kelajak hayotlarini yashaydilar.

Eslatma : bu sonlar ko'rsatilgan usulda to'g'ri ishlash uchun bizga berilgan son yaxlitlanmagan shaklda bo'lishi lozim

BIRINCHI HOLAT

Bu holatda modda miqdorining son qiymati 1-49 (vergul hisobga olinmagan holda) gacha bo'lgan sonlarda qo'llaniladi, masalan : **24 ; 2,4 ; 0,24 ; 47 ; 4,7** ; 0,47

$$6{,}02 \cdot 10^{23}$$

1) Boshidagi 2ta sonni chamalash uchun ishlatiladi

2) Oxiridagi 2 ta sonni 2 ga bo'lish orqali javob tasdiqlanadi

Masalan :

$$\frac{2{,}7692 \cdot 10^{23}}{6{,}02 \cdot 10^{23}} = 0{,}46$$

$$2{,}7692 \cdot 10^{23}$$

1) Demak, 4·6=24 bo'lgani uchun bu yerda taxminan **4** dan kattaroq son ekan (vergul sabab **0,4** dan kattaroq).

2) Demak, 92/2=46 ekan, biz ham aynan 4 dan (0,4 dan) kattaroq son kutayotgan edik, demak, javobimiz to'g'ri

3) Vergul chap tomonga bir marta surilgani uchun bu yerda ham bittaga chapga suramiz, shunda javobimiz **0,46** bo'ldi.

Maslahat : ishlash mobaynida vergul va darajalarga e'tibor bermasdan ishlab, oxirida javob chiqqanidan so'ng vergul va darajalarga qarab javobni to'g'rilab qo'yamiz.

Video tushuntirish → **YouTube** : Kimyo uchun Matematika "Avogadro 1-holat"

Eslatma : bu sonlar ko'rsatilgan usulda to'g'ri ishlash uchun bizga berilgan son yaxlitlanmagan shaklda bo'lishi lozim

IKKINCHI HOLAT

Bu holatda modda miqdorining son qiymati 51-99 (vergul hisobga olinmagan holda) gacha bo'lgan sonlarda qo'llaniladi, masalan : **67 ; 6,7 ; 0,67 ; 84 ; 8,4 ; 0,84**

$$6{,}02 \cdot 10^{23}$$

1) Boshidagi 2ta sonni chamalash uchun ishlatiladi

2) Oxiridagi 2 ta sonni 2 ga bo'lish orqali javob tasdiqlanadi

Masalan :

$$\frac{4{,}6956 \cdot 10^{23}}{6{,}02 \cdot 10^{23}} = 0{,}78$$

$$4{,}6956 \cdot 10^{23}$$

1) Demak, 6·7=42 bo'lgani uchun bu yerda tahminan 7 dan kattaroq son ekan (vergul sabab 70 dan kattaroq).

2) Demak, 56/2=28 ekan, ammo biz kutayotgan javobda 7 dan (70 dan) kattaroq bo'lishi kerak edi.

3) Demak, bu yerda 56 ni o'rniga yoniga 1 sonini qo'yib, 156 olinadi va 2 ga bo'linadi 156/2=78 biz ham aynan shu raqamni kutgan edik.

4) Vergul chap tomonga ikki marta surilgani uchun bu yerda ham ikkita chapga suramiz, shunda javobimiz **0,78** bo'ldi.

Maslahat : ishlash mobaynida vergul va darajalarga e'tibor bermagan holda ishlab, oxirida javob chiqqanidan so'ng vergul va darajalarga qarab javobni to'g'rilab qo'yamiz.

Video tushuntirish

YouTube : Kimyo uchun Matematika "Avogadro 2-holat"

Avogadro 1-2 -bosqich

No	1-bosqich	2-bosqich	3-bosqich	4-bosqich
1	$\frac{12,04\cdot10^{23}}{6,02\cdot10^{23}}=$	$\frac{15,05\cdot10^{23}}{6,02\cdot10^{23}}=$	$\frac{1,204\cdot10^{23}}{6,02\cdot10^{23}}=$	$\frac{15,05\cdot10^{22}}{6,02\cdot10^{23}}=$
2	$\frac{24,08\cdot10^{23}}{6,02\cdot10^{23}}=$	$\frac{21,07\cdot10^{23}}{6,02\cdot10^{23}}=$	$\frac{1,806\cdot10^{23}}{6,02\cdot10^{23}}=$	$\frac{21,07\cdot10^{23}}{6,02\cdot10^{23}}=$
3	$\frac{30,1\cdot10^{23}}{6,02\cdot10^{23}}=$	$\frac{276,92\cdot10^{22}}{6,02\cdot10^{23}}=$	$\frac{2,709\cdot10^{23}}{6,02\cdot10^{23}}=$	$\frac{2709\cdot10^{22}}{6,02\cdot10^{23}}=$
4	$\frac{36,12\cdot10^{23}}{6,02\cdot10^{23}}=$	$\frac{12,642\cdot10^{23}}{6,02\cdot10^{23}}=$	$\frac{15,05\cdot10^{22}}{6,02\cdot10^{23}}=$	$\frac{903\cdot10^{22}}{6,02\cdot10^{23}}=$
5	$\frac{150,5\cdot10^{23}}{6,02\cdot10^{23}}=$	$\frac{19,866\cdot10^{23}}{6,02\cdot10^{23}}=$	$\frac{0,8428\cdot10^{23}}{6,02\cdot10^{23}}=$	$\frac{722,4\cdot10^{20}}{6,02\cdot10^{23}}=$
6	$\frac{8,428\cdot10^{24}}{6,02\cdot10^{23}}=$	$\frac{28,896\cdot10^{23}}{6,02\cdot10^{23}}=$	$\frac{2,1672\cdot10^{23}}{6,02\cdot10^{23}}=$	$\frac{27,09\cdot10^{22}}{6,02\cdot10^{23}}=$
7	$\frac{270,9\cdot10^{23}}{6,02\cdot10^{23}}=$	$\frac{19,264\cdot10^{23}}{6,02\cdot10^{23}}=$	$\frac{10,234\cdot10^{22}}{6,02\cdot10^{23}}=$	$\frac{18,662\cdot10^{24}}{6,02\cdot10^{23}}=$
8	$\frac{192,64\cdot10^{23}}{6,02\cdot10^{23}}=$	$\frac{8,428\cdot10^{23}}{6,02\cdot10^{23}}=$	$\frac{1,6856\cdot10^{23}}{6,02\cdot10^{23}}=$	$\frac{84,28\cdot10^{23}}{6,02\cdot10^{23}}=$
9	$\frac{126,42\cdot10^{23}}{6,02\cdot10^{23}}=$	$\frac{114,38\cdot10^{22}}{6,02\cdot10^{23}}=$	$\frac{2,3478\cdot10^{23}}{6,02\cdot10^{23}}=$	$\frac{42,14\cdot10^{22}}{6,02\cdot10^{23}}=$
10	$\frac{78,26\cdot10^{23}}{6,02\cdot10^{23}}=$	$\frac{23,478\cdot10^{23}}{6,02\cdot10^{23}}=$	$\frac{2,4682\cdot10^{23}}{6,02\cdot10^{23}}=$	$\frac{7,826\cdot10^{24}}{6,02\cdot10^{23}}=$
11	$\frac{210,7\cdot10^{23}}{6,02\cdot10^{23}}=$	$\frac{16,254\cdot10^{23}}{6,02\cdot10^{23}}=$	$\frac{1,0836\cdot10^{23}}{6,02\cdot10^{23}}=$	$\frac{1,4448\cdot10^{25}}{6,02\cdot10^{23}}=$
12	$\frac{2,6488\cdot10^{25}}{6,02\cdot10^{23}}=$	$\frac{96,32\cdot10^{22}}{6,02\cdot10^{23}}=$	$\frac{1,5652\cdot10^{23}}{6,02\cdot10^{23}}=$	$\frac{0,13846\cdot10^{25}}{6,02\cdot10^{23}}=$
13	$\frac{156,52\cdot10^{23}}{6,02\cdot10^{23}}=$	$\frac{25,284\cdot10^{23}}{6,02\cdot10^{23}}=$	$\frac{18,662\cdot10^{22}}{6,02\cdot10^{23}}=$	$\frac{2829,4\cdot10^{20}}{6,02\cdot10^{23}}=$
14	$\frac{252,84\cdot10^{23}}{6,02\cdot10^{23}}=$	$\frac{6,622\cdot10^{23}}{6,02\cdot10^{23}}=$	$\frac{1,3244\cdot10^{23}}{6,02\cdot10^{23}}=$	$\frac{132,44\cdot10^{21}}{6,02\cdot10^{23}}=$
15	$\frac{22274\cdot10^{21}}{6,02\cdot10^{23}}=$	$\frac{7,826\cdot10^{23}}{6,02\cdot10^{23}}=$	$\frac{2,4682\cdot10^{23}}{6,02\cdot10^{23}}=$	$\frac{18662\cdot10^{19}}{6,02\cdot10^{23}}=$
16	$\frac{114,38\cdot10^{23}}{6,02\cdot10^{23}}=$	$\frac{14,448\cdot10^{23}}{6,02\cdot10^{23}}=$	$\frac{0,7224\cdot10^{23}}{6,02\cdot10^{23}}=$	$\frac{0,29498\cdot10^{26}}{6,02\cdot10^{23}}=$
17	$\frac{168,56\cdot10^{23}}{6,02\cdot10^{23}}=$	$\frac{21,672\cdot10^{23}}{6,02\cdot10^{23}}=$	$\frac{1,4448\cdot10^{23}}{6,02\cdot10^{23}}=$	$\frac{20,458\cdot10^{23}}{6,02\cdot10^{23}}=$

Avogadro 2-4 -bosqich

No	5-bosqich	6-bosqich	7-bosqich	8-bosqich
1	$\frac{313{,}04\cdot10^{23}}{6{,}02\cdot10^{23}}=$	$\frac{33{,}712\cdot10^{23}}{6{,}02\cdot10^{23}}=$	$\frac{307020\cdot10^{18}}{6{,}02\cdot10^{23}}=$	$\frac{34{,}916\cdot10^{22}}{6{,}02\cdot10^{23}}=$
2	$\frac{379{,}26\cdot10^{23}}{6{,}02\cdot10^{23}}=$	$\frac{39{,}732\cdot10^{23}}{6{,}02\cdot10^{23}}=$	$\frac{3{,}7324\cdot10^{23}}{6{,}02\cdot10^{23}}=$	$\frac{37{,}324\cdot10^{23}}{6{,}02\cdot10^{23}}=$
3	$\frac{445{,}48\cdot10^{23}}{6{,}02\cdot10^{23}}=$	$\frac{457{,}52\cdot10^{22}}{6{,}02\cdot10^{23}}=$	$\frac{4{,}3946\cdot10^{23}}{6{,}02\cdot10^{23}}=$	$\frac{52{,}976\cdot10^{24}}{6{,}02\cdot10^{23}}=$
4	$\frac{51{,}17\cdot10^{24}}{6{,}02\cdot10^{23}}=$	$\frac{52{,}374\cdot10^{23}}{6{,}02\cdot10^{23}}=$	$\frac{50{,}568\cdot10^{22}}{6{,}02\cdot10^{23}}=$	$\frac{41{,}538\cdot10^{22}}{6{,}02\cdot10^{23}}=$
5	$\frac{577{,}92\cdot10^{23}}{6{,}02\cdot10^{23}}=$	$\frac{57{,}19\cdot10^{23}}{6{,}02\cdot10^{23}}=$	$\frac{5{,}719\cdot10^{23}}{6{,}02\cdot10^{23}}=$	$\frac{53{,}578\cdot10^{23}}{6{,}02\cdot10^{23}}=$
6	$\frac{325{,}08\cdot10^{23}}{6{,}02\cdot10^{23}}=$	$\frac{30{,}702\cdot10^{23}}{6{,}02\cdot10^{23}}=$	$\frac{3{,}311\cdot10^{23}}{6{,}02\cdot10^{23}}=$	$\frac{56{,}888\cdot10^{24}}{6{,}02\cdot10^{23}}=$
7	$\frac{391{,}3\cdot10^{23}}{6{,}02\cdot10^{23}}=$	$\frac{4033{,}4\cdot10^{21}}{6{,}02\cdot10^{23}}=$	$\frac{3{,}913\cdot10^{23}}{6{,}02\cdot10^{23}}=$	$\frac{33{,}11\cdot10^{22}}{6{,}02\cdot10^{23}}=$
8	$\frac{4{,}6354\cdot10^{25}}{6{,}02\cdot10^{23}}=$	$\frac{50{,}568\cdot10^{23}}{6{,}02\cdot10^{23}}=$	$\frac{45{,}15\cdot10^{22}}{6{,}02\cdot10^{23}}=$	$\frac{56{,}588\cdot10^{23}}{6{,}02\cdot10^{23}}=$
9	$\frac{523{,}74\cdot10^{23}}{6{,}02\cdot10^{23}}=$	$\frac{55{,}986\cdot10^{23}}{6{,}02\cdot10^{23}}=$	$\frac{5{,}117\cdot10^{23}}{6{,}02\cdot10^{23}}=$	$\frac{4{,}6956\cdot10^{25}}{6{,}02\cdot10^{23}}=$
10	$\frac{577{,}92\cdot10^{23}}{6{,}02\cdot10^{23}}=$	$\frac{31{,}304\cdot10^{23}}{6{,}02\cdot10^{23}}=$	$\frac{683{,}94\cdot10^{21}}{6{,}02\cdot10^{23}}=$	$\frac{45{,}15\cdot10^{22}}{6{,}02\cdot10^{23}}=$
11	$\frac{349{,}16\cdot10^{23}}{6{,}02\cdot10^{23}}=$	$\frac{39{,}732\cdot10^{23}}{6{,}02\cdot10^{23}}=$	$\frac{3{,}4314\cdot10^{23}}{6{,}02\cdot10^{23}}=$	$\frac{40{,}334\cdot10^{23}}{6{,}02\cdot10^{23}}=$
12	$\frac{385{,}28\cdot10^{23}}{6{,}02\cdot10^{23}}=$	$\frac{47558\cdot10^{20}}{6{,}02\cdot10^{23}}=$	$\frac{4{,}0736\cdot10^{23}}{6{,}02\cdot10^{23}}=$	$\frac{57{,}792\cdot10^{23}}{6{,}02\cdot10^{23}}=$
13	$\frac{427{,}42\cdot10^{23}}{6{,}02\cdot10^{23}}=$	$\frac{52{,}976\cdot10^{23}}{6{,}02\cdot10^{23}}=$	$\frac{4{,}7558\cdot10^{23}}{6{,}02\cdot10^{23}}=$	$\frac{4635{,}4\cdot10^{22}}{6{,}02\cdot10^{23}}=$
14	$\frac{493{,}64\cdot10^{23}}{6{,}02\cdot10^{23}}=$	$\frac{54{,}782\cdot10^{23}}{6{,}02\cdot10^{23}}=$	$\frac{4{,}8762\cdot10^{23}}{6{,}02\cdot10^{23}}=$	$\frac{48{,}762\cdot10^{22}}{6{,}02\cdot10^{23}}=$
15	$\frac{559{,}86\cdot10^{23}}{6{,}02\cdot10^{23}}=$	$\frac{3311\cdot10^{21}}{6{,}02\cdot10^{23}}=$	$\frac{5779{,}2\cdot10^{20}}{6{,}02\cdot10^{23}}=$	$\frac{37{,}324\cdot10^{22}}{6{,}02\cdot10^{23}}=$
16	$\frac{355{,}18\cdot10^{23}}{6{,}02\cdot10^{23}}=$	$\frac{39{,}13\cdot10^{23}}{6{,}02\cdot10^{23}}=$	$\frac{3{,}4416\cdot10^{23}}{6{,}02\cdot10^{23}}=$	$\frac{45{,}15\cdot10^{23}}{6{,}02\cdot10^{23}}=$
17	$\frac{3{,}9732\cdot10^{25}}{6{,}02\cdot10^{23}}=$	$\frac{45{,}15\cdot10^{23}}{6{,}02\cdot10^{23}}=$	$\frac{3{,}7926\cdot10^{23}}{6{,}02\cdot10^{23}}=$	$\frac{4093{,}6\cdot10^{21}}{6{,}02\cdot10^{23}}=$

Avogadro 5-6 -bosqich

No	9-bosqich		10-bosqich	
1	$\frac{13,244\cdot10^{22}}{6,02\cdot10^{23}}=$	$\frac{0,06622\cdot10^{24}}{6,02\cdot10^{23}}=$	$\frac{7,224\cdot10^{24}}{6,02\cdot10^{23}}=$	$\frac{33712\cdot10^{19}}{6,02\cdot10^{23}}=$
2	$\frac{1986,6\cdot10^{21}}{6,02\cdot10^{23}}=$	$\frac{0,13846\cdot10^{26}}{6,02\cdot10^{23}}=$	$\frac{1384,6\cdot10^{21}}{6,02\cdot10^{23}}=$	$\frac{2,107\cdot10^{25}}{6,02\cdot10^{23}}=$
3	$\frac{0,1505\cdot10^{22}}{6,02\cdot10^{23}}=$	$\frac{0,301\cdot10^{24}}{6,02\cdot10^{23}}=$	$\frac{2709\cdot10^{20}}{6,02\cdot10^{23}}=$	$\frac{2468,2\cdot10^{21}}{6,02\cdot10^{23}}=$
4	$\frac{5,9598\cdot10^{25}}{6,02\cdot10^{23}}=$	$\frac{2408\cdot10^{22}}{6,02\cdot10^{23}}=$	$\frac{0,7224\cdot10^{25}}{6,02\cdot10^{23}}=$	$\frac{19,264\cdot10^{24}}{6,02\cdot10^{23}}=$
5	$\frac{30702\cdot10^{22}}{6,02\cdot10^{23}}=$	$\frac{0,12642\cdot10^{25}}{6,02\cdot10^{23}}=$	$\frac{3913\cdot10^{21}}{6,02\cdot10^{23}}=$	$\frac{27,09\cdot10^{24}}{6,02\cdot10^{23}}=$
6	$\frac{5,418\cdot10^{23}}{6,02\cdot10^{23}}=$	$\frac{18662\cdot10^{21}}{6,02\cdot10^{23}}=$	$\frac{0,46956\cdot10^{26}}{6,02\cdot10^{23}}=$	$\frac{5,2976\cdot10^{25}}{6,02\cdot10^{23}}=$
7	$\frac{12,04\cdot10^{24}}{6,02\cdot10^{23}}=$	$\frac{0,31304\cdot10^{24}}{6,02\cdot10^{23}}=$	$\frac{7224\cdot10^{19}}{6,02\cdot10^{23}}=$	$\frac{5899,6\cdot10^{21}}{6,02\cdot10^{23}}=$
8	$\frac{0,6622\cdot10^{24}}{6,02\cdot10^{23}}=$	$\frac{40,936\cdot10^{23}}{6,02\cdot10^{23}}=$	$\frac{782,6\cdot10^{22}}{6,02\cdot10^{23}}=$	$\frac{28,896\cdot10^{24}}{6,02\cdot10^{23}}=$
9	$\frac{6,622\cdot10^{24}}{6,02\cdot10^{23}}=$	$\frac{4,4548\cdot10^{25}}{6,02\cdot10^{23}}=$	$\frac{337,12\cdot10^{22}}{6,02\cdot10^{23}}=$	$\frac{27,09\cdot10^{24}}{6,02\cdot10^{23}}=$
10	$\frac{14448\cdot10^{19}}{6,02\cdot10^{23}}=$	$\frac{4334,4\cdot10^{20}}{6,02\cdot10^{23}}=$	$\frac{1,9866\cdot10^{25}}{6,02\cdot10^{23}}=$	$\frac{6,02\cdot10^{22}}{6,02\cdot10^{23}}=$
11	$\frac{19,264\cdot10^{24}}{6,02\cdot10^{23}}=$	$\frac{963,2\cdot10^{22}}{6,02\cdot10^{23}}=$	$\frac{4635,4\cdot10^{20}}{6,02\cdot10^{23}}=$	$\frac{662,2\cdot10^{22}}{6,02\cdot10^{23}}=$
12	$\frac{150,5\cdot10^{22}}{6,02\cdot10^{23}}=$	$\frac{150,5\cdot10^{22}}{6,02\cdot10^{23}}=$	$\frac{5,3578\cdot10^{25}}{6,02\cdot10^{23}}=$	$\frac{722,4\cdot10^{21}}{6,02\cdot10^{23}}=$
13	$\frac{33,11\cdot10^{24}}{6,02\cdot10^{23}}=$	$\frac{2,0468\cdot10^{25}}{6,02\cdot10^{23}}=$	$\frac{55986\cdot10^{22}}{6,02\cdot10^{23}}=$	$\frac{782,6\cdot10^{22}}{6,02\cdot10^{23}}=$
14	$\frac{36,722\cdot10^{22}}{6,02\cdot10^{23}}=$	$\frac{30702\cdot10^{19}}{6,02\cdot10^{23}}=$	$\frac{1384,6\cdot10^{22}}{6,02\cdot10^{23}}=$	$\frac{451,5\cdot10^{21}}{6,02\cdot10^{23}}=$
15	$\frac{4695,6\cdot10^{22}}{6,02\cdot10^{23}}=$	$\frac{19,264\cdot10^{24}}{6,02\cdot10^{23}}=$	$\frac{24682\cdot10^{18}}{6,02\cdot10^{23}}=$	$\frac{9,03\cdot10^{24}}{6,02\cdot10^{23}}=$
16	$\frac{5779,2\cdot10^{21}}{6,02\cdot10^{23}}=$	$\frac{553,84\cdot10^{22}}{6,02\cdot10^{23}}=$	$\frac{44,548\cdot10^{24}}{6,02\cdot10^{23}}=$	$\frac{96,32\cdot10^{22}}{6,02\cdot10^{23}}=$
17	$\frac{19264\cdot10^{21}}{6,02\cdot10^{23}}=$	$\frac{0,24682\cdot10^{26}}{6,02\cdot10^{23}}=$	$\frac{4214\cdot10^{22}}{6,02\cdot10^{23}}=$	$\frac{3,8528\cdot10^{25}}{6,02\cdot10^{23}}=$

HAJM

O'zing bajarmagan narsa bilan faxrlanishing aybdir !!

Husn-u jamoling bilan faxrlanma,
chunki, uni sen yaratmagansan,
Nasl-u nasabing bilan ham faxrlanma,
chunki, uni sen tanlamagansan,
Ammo odob-axloqing bilan faxrlanaver,
chunki, sen u bilan o'zing bezangansan!

Bu usulni qo'llash uchun, ko'p uchraydigan hajm va ularning miqdorlarini son qiymatlarini yod olish kerak

Quydagi eng ko'p ishlatiladigan hajm va miqdorlarga asoslanib,

Asosiy

$$\frac{22,4}{22,4} = 1 \qquad \frac{89,6}{22,4} = 4 \qquad \frac{156,8}{22,4} = 7$$

$$\frac{44,8}{22,4} = 2 \qquad \frac{112}{22,4} = 5 \qquad \frac{179,2}{22,4} = 8$$

$$\frac{67,2}{22,4} = 3 \qquad \frac{134,4}{22,4} = 6 \qquad \frac{201,6}{22,4} = 9$$

Qo'shimcha

$$\frac{28}{22,4} = 1,25 \qquad \frac{56}{22,4} = 2,5$$

$$\frac{33,6}{22,4} = 1,5 \qquad \frac{168}{22,4} = 7,5$$

Quydagilarni yod oling !

Hajm	Mol	Hajm	Mol
2,24	0,1	11,2	0,5
2,8	0,125	13,44	0,6
3,36	0,15	15,68	0,7
4,48	0,2	16,8	0,75
5,6	0,25	17,92	0,8
6,72	0,3	20,16	0,9
8,96	0,4		

Jismning aybini bir parcha mato ham yopib turadi, ammo fikrning ayblarini birgina so'z ham fosh qiladi.

Biz yod olgan asosiy holatlardan tashqari bo'lgan holatlar

Hajmdan mol toppish (1)

Bu holatda hajm bizga yod bo'lmagan miqdorlar (mollar)ga ko'paytirilgan bo'ladi, masalan : 45 ; 4,5 ; 0,45 ; 83 ; 8,3 ; 0,83

Masalan :

$$\frac{13,888}{22,4} = 0,62$$

$$\begin{array}{lr} & 13,888 \\ (0,6) & -\ 13,44 \\ \hline + & 0,448 \\ (0,02) & -\ 0,448 \\ \hline = (0,62) & 0,000 \end{array}$$

1) Biz yod olgan asosiy mollar ichidan 13,888 ga yaqin bo'lgan son tanlab olinadi, demak, u son bizda 13,44 , yani **0,6** va bu raqam hayolan dilda saqlab turiladi.

2) 13,888 dan biz tanlagan 13,44 ayriladi va natija : 0,448 yozib olinadi.

3) Endi hosil bo'lgan raqam (0,448) biz yod olgan mollardan biri bo'lgani uchun shu sonning (0,448) o'zini yana ayiramiz va bizda chiqqan molni (**0,2**) hayolan saqlab qolamiz.

4) Sonlar 0 ga teng bo'ldi, demak, ishimiz oxirigacha yetdi. 0 chiqmagan holatda yana 3 bosqichda amalga oshirgan ishlarimizni qaytarar edik.

5) Endi biz hayolan saqlab qolgan sonlarni bir-biriga qo'shib chiqamiz (0,6 + 0,02 = 0,62). Demak, bizning javobimiz **0,62** ekan.

Hayot qanchalik mashaqqatli va qiyin bo'lsa-da, unda halollikning o'ziga xos xushbo'y ta'mi bor.

Biz yod olgan asosiy holatlardan tashqari bo'lgan holatlar

Hajmdan mol topish (2)

Bu holatda hajm bizga yod bo'lmagan miqdorlar (mollar)ga ko'paytirilgan bo'ladi, masalan : 45 ; 4,5 ; 0,45 ; 83 ; 8,3 ; 0,83

Masalan :

$$\frac{14,56}{22,4} = 0,65$$

1) Biz yod olgan asosiy mollar ichidan 14,56 ga yaqin bo'lgan son tanlab olinadi, demak, u son bizda **15,68** , yani **0,7** va bu raqam hayolan saqlab turiladi.

$$\begin{array}{lr} (0,7) & 15,68 \\ - & 14,56 \\ \hline & 1,12 \\ (0,05) & 1,12 \\ \hline = (0,65) & 0,00 \end{array}$$

2) biz tanlagan 15,68 dan 14,56 ni ayiramiz va **0,112** natijani yozib olamiz.

3) Endi hosil bo'lgan raqam (0,112) biz yod olgan mollardan biri bo'lgani uchun shu sonning (0,112) o'zini yana ayiramiz va bizda chiqqan molni (**0,2**) hayolan saqlab qolamiz.

4) Sonlar 0 ga teng bo'ldi, demak, ishimiz oxirigacha yetdi. Agar 0 chiqmagan bo'lganida yana 3 bosqichda qilgan ishlarimizni qaytarar edik.

5) Endi biz hayolan saqlab qolgan sonlarni bir-biridan ayirib chiqamiz (0,7 – 0,05 = 0,65). Demak, bizning javobimiz **0,62** ekan.

Video tushuntirish

YouTube : Kimyo uchun Matematika "Hajmdan mol topish 1,2-misol"

Biz yod olgan asosiy holatlardan tashqari bo'lgan holatlar

Moldan hajm topish (1)

Bu holatda hajm bizga yod bo'lmagan miqdorlar (mollar)ga ko'paytirilgan bo'ladi, masalan : 45 ; 4,5 ; 0,45 ; 83 ; 8,3 ; 0,83

Masalan :

$$4{,}7 \cdot 22{,}4 = 105{,}28$$

1) 4,7 ga ko'paytirish bizga noqulay bo'lgani uchun, uni bizga qulay bo'lgan sonlarga maydalab olamiz.

$$4{,}7 \rightarrow 4 + 0{,}7$$

2) Yod olgan jadvalimiz bo'yicha 4 molga mos hajm bu 89,6.

$$4 \rightarrow 89{,}6$$

3) Yod olgan jadvalimiz bo'yicha 0,7 molga mos hajm bu 15,68.

$$0{,}7 \rightarrow 15{,}68$$

$$89{,}6 + 15{,}68 = 105{,}28$$

4) Yakuniy javobimiz 4 va 0,7 mollarga mos bo'lgan hajmlarni bir-biriga qo'shish..

Video tushuntirish → **YouTube** : Kimyo uchun Matematika "Moldan hajm toppish 1-misol"

Biz yod olgan asosiy holatlardan tashqari bo'lgan holatlar

Moldan hajm topish (2)

Bu holatda hajm bizga yod bo'lmagan miqdorlar (mollar)ga ko'paytirilgan bo'ladi, masalan : 45 ; 4,5 ; 0,45 ; 83 ; 8,3 ; 0,83

Masalan :

$$4{,}7 \cdot 22{,}4 = 105{,}28$$

1) 4,7 ga ko'paytirish biz uchun noqulay bo'lgani uchun, uni bizga qulay bo'lgan sonlarga maydalab olamiz.

$$4{,}7 \to 5 - 0{,}3$$

2) Yod olgan jadvalimiz bo'yicha 5 molga mos hajm bu **112**.

3) Yod olgan jadvalimiz bo'yicha 0,3 molga mos hajm bu 6,72.

$$5 \to 112$$

$$0{,}3 \to 6{,}72$$

$$112 - 6{,}72 = 105{,}28$$

4) Yakuniy javobimiz 5 va 0,3 mollarga mos bo'lgan hajmlarni bir-biridan ayirish..

Video tushuntirish → **YouTube** : Kimyo uchun Matematika "Moldan hajm toppish 2-misol"

Hajmdan mol 1-5 -bosqich

No	1-bosqich	2-bosqich	3-bosqich	4-bosqich	5-bosqich
1	$\frac{2,24}{22,4} =$	$\frac{3,36}{22,4} =$	$\frac{56}{22,4} =$	$\frac{10,08}{22,4} =$	$\frac{0,448}{22,4} =$
2	$\frac{44,8}{22,4} =$	$\frac{5,6}{22,4} =$	$\frac{2,24}{22,4} =$	$\frac{19,04}{22,4} =$	$\frac{0,224}{22,4} =$
3	$\frac{6,72}{22,4} =$	$\frac{16,8}{22,4} =$	$\frac{16,8}{22,4} =$	$\frac{21,504}{22,4} =$	$\frac{0,672}{22,4} =$
4	$\frac{67,2}{22,4} =$	$\frac{2,8}{22,4} =$	$\frac{8,96}{22,4} =$	$\frac{9,184}{22,4} =$	$\frac{1,12}{22,4} =$
5	$\frac{89,6}{22,4} =$	$\frac{33,6}{22,4} =$	$\frac{13,44}{22,4} =$	$\frac{7,84}{22,4} =$	$\frac{1,344}{22,4} =$
6	$\frac{8,96}{22,4} =$	$\frac{56}{22,4} =$	$\frac{156,8}{22,4} =$	$\frac{6,496}{22,4} =$	$\frac{2,016}{22,4} =$
7	$\frac{112}{22,4} =$	$\frac{168}{22,4} =$	$\frac{13,44}{22,4} =$	$\frac{16,576}{22,4} =$	$\frac{1,68}{22,4} =$
8	$\frac{134,4}{22,4} =$	$\frac{112}{22,4} =$	$\frac{17,92}{22,4} =$	$\frac{20,608}{22,4} =$	$\frac{0,56}{22,4} =$
9	$\frac{11,2}{22,4} =$	$\frac{67,2}{22,4} =$	$\frac{20,16}{22,4} =$	$\frac{12,32}{22,4} =$	$\frac{0,336}{22,4} =$
10	$\frac{13,44}{22,4} =$	$\frac{8,96}{22,4} =$	$\frac{67,2}{22,4} =$	$\frac{19,488}{22,4} =$	$\frac{0,28}{22,4} =$
11	$\frac{15,68}{22,4} =$	$\frac{13,44}{22,4} =$	$\frac{89,6}{22,4} =$	$\frac{22,176}{22,4} =$	$\frac{0,896}{22,4} =$
12	$\frac{17,92}{22,4} =$	$\frac{156,8}{22,4} =$	$\frac{134,4}{22,4} =$	$\frac{7,616}{22,4} =$	$\frac{1,568}{22,4} =$
13	$\frac{156,8}{22,4} =$	$\frac{17,92}{22,4} =$	$\frac{44,8}{22,4} =$	$\frac{12,096}{22,4} =$	$\frac{1,792}{22,4} =$
14	$\frac{179,2}{22,4} =$	$\frac{201,6}{22,4} =$	$\frac{22,4}{22,4} =$	$\frac{14,874}{22,4} =$	$\frac{2,016}{22,4} =$
15	$\frac{201,6}{22,4} =$	$\frac{20,16}{22,4} =$	$\frac{179,2}{22,4} =$	$\frac{17,248}{22,4} =$	$\frac{1,456}{22,4} =$
16	$\frac{20,16}{22,4} =$	$\frac{179,2}{22,4} =$	$\frac{3,36}{22,4} =$	$\frac{8,736}{22,4} =$	$\frac{1,008}{22,4} =$
17	$\frac{22,4}{22,4} =$	$\frac{22,4}{22,4} =$	$\frac{280}{22,4} =$	$\frac{9,856}{22,4} =$	$\frac{1,904}{22,4} =$

Hajmdan mol 6-10 -bosqich

No	6-bosqich	7-bosqich	8-bosqich	9-bosqich	10-bosqich
1	$\frac{58,24}{22,4} =$	$\frac{1008}{22,4} =$	$\frac{9,968}{22,4} =$	$\frac{6,72}{22,4} =$	$\frac{56}{22,4} =$
2	$\frac{35,84}{22,4} =$	$\frac{582,4}{22,4} =$	$\frac{5,04}{22,4} =$	$\frac{8,96}{22,4} =$	$\frac{145,6}{22,4} =$
3	$\frac{76,16}{22,4} =$	$\frac{1680}{22,4} =$	$\frac{8,4}{22,4} =$	$\frac{11,2}{22,4} =$	$\frac{280}{22,4} =$
4	$\frac{103,04}{22,4} =$	$\frac{2150,4}{22,4} =$	$\frac{19,6}{22,4} =$	$\frac{5,6}{22,4} =$	$\frac{1456}{22,4} =$
5	$\frac{129,92}{22,4} =$	$\frac{784}{22,4} =$	$\frac{2,8}{22,4} =$	$\frac{19,6}{22,4} =$	$\frac{1008}{22,4} =$
6	$\frac{150,08}{22,4} =$	$\frac{1097,6}{22,4} =$	$\frac{14}{22,4} =$	$\frac{59,36}{22,4} =$	$\frac{560}{22,4} =$
7	$\frac{188,16}{22,4} =$	$\frac{1164,8}{22,4} =$	$\frac{16,688}{22,4} =$	$\frac{56}{22,4} =$	$\frac{2150,4}{22,4} =$
8	$\frac{221,76}{22,4} =$	$\frac{1478,4}{22,4} =$	$\frac{3,024}{22,4} =$	$\frac{145,6}{22,4} =$	$\frac{1680}{22,4} =$
9	$\frac{40,32}{22,4} =$	$\frac{1724,8}{22,4} =$	$\frac{10,864}{22,4} =$	$\frac{16,8}{22,4} =$	$\frac{16,8}{22,4} =$
10	$\frac{49,28}{22,4} =$	$\frac{1836,8}{22,4} =$	$\frac{13,104}{22,4} =$	$\frac{190,4}{22,4} =$	$\frac{3,024}{22,4} =$
11	$\frac{69,44}{22,4} =$	$\frac{291,2}{22,4} =$	$\frac{15,12}{22,4} =$	$\frac{21,28}{22,4} =$	$\frac{17,584}{22,4} =$
12	$\frac{91,84}{22,4} =$	$\frac{627,2}{22,4} =$	$\frac{18,48}{22,4} =$	$\frac{3,36}{22,4} =$	$\frac{21,28}{22,4} =$
13	$\frac{116,48}{22,4} =$	$\frac{761,6}{22,4} =$	$\frac{21,616}{22,4} =$	$\frac{9,968}{22,4} =$	$\frac{14,896}{22,4} =$
14	$\frac{138,88}{22,4} =$	$\frac{1052,8}{22,4} =$	$\frac{16,016}{22,4} =$	$\frac{22,064}{22,4} =$	$\frac{140}{22,4} =$
15	$\frac{173,6}{22,4} =$	$\frac{1321,6}{22,4} =$	$\frac{17,36}{22,4} =$	$\frac{14,448}{22,4} =$	$\frac{41,44}{22,4} =$
16	$\frac{50,4}{22,4} =$	$\frac{1433,6}{22,4} =$	$\frac{7,728}{22,4} =$	$\frac{17,92}{22,4} =$	$\frac{15,344}{22,4} =$
17	$\frac{72,8}{22,4} =$	$\frac{1747,2}{22,4} =$	$\frac{13,776}{22,4} =$	$\frac{20,16}{22,4} =$	$\frac{36,96}{22,4} =$

Moldan hajm 1-4 -bosqich

No	1-bosqich		2-bosqich		3-bosqich		4-bosqich	
1	32 · 22,4 =		0,62 · 22,4 =		4,6 · 22,4 =		26 · 22,4 =	
2	26 · 22,4 =		0,75 · 22,4 =		2,6 · 22,4 =		7,8 · 22,4 =	
3	34 · 22,4 =		0,58 · 22,4 =		3,4 · 22,4 =		52 · 22,4 =	
4	41 · 22,4 =		0,44 · 22,4 =		4,1 · 22,4 =		0,225 · 22,4 =	
5	52 · 22,4 =		0,97 · 22,4 =		5,25 · 22,4 =		1,3 · 22,4 =	
6	56 · 22,4 =		0,375 · 22,4 =		6,7 · 22,4 =		35 · 22,4 =	
7	63 · 22,4 =		0,425 · 22,4 =		4,7 · 22,4 =		42 ·22,4=	
8	74 · 22,4 =		0,525 · 22,4 =		3,3 · 22,4 =		0,285 ·22,4=	
9	88 · 22,4 =		0,625 · 22,4 =		2,5 · 22,4 =		0,67 ·22,4=	
10	95 · 22,4 =		0,74 · 22,4 =		1,3 · 22,4 =		4,25 ·22,4=	
11	85 · 22,4 =		0,12 · 22,4 =		9,9 · 22,4 =		6,65 · 22,4 =	
12	77 · 22,4 =		0,24 · 22,4 =		9,1 · 22,4 =		2,2 · 22,4 =	
13	66 · 22,4 =		0,36 · 22,4 =		8,6 · 22,4 =		62 · 22,4 =	
14	54 · 22,4 =		0,48 · 22,4 =		7,5 · 22,4 =		79 · 22,4 =	
15	52 · 22,4 =		0,62 · 22,4 =		6,85 · 22,4 =		12 · 22,4 =	
16	43 · 22,4 =		0,74 · 22,4 =		4,4 · 22,4 =		0,335 · 22,4 =	
17	39 · 22,4 =		0,88 · 22,4 =		2,7 · 22,4 =		0,885 · 22,4 =	
18	22 · 22,4 =		0,96 · 22,4 =		3,7 · 22,4 =		0,995 · 22,4 =	
19	11 · 22,4 =		0,82 · 22,4 =		2,9 · 22,4 =		0,775 · 22,4 =	
20	16 · 22,4 =		0,76 · 22,4 =		1,6 · 22,4 =		3,45 · 22,4 =	
21	29 · 22,4 =		0,775 · 22,4 =		1,1 · 22,4 =		9,6 · 22,4 =	
22	37 · 22,4 =		0,665 · 22,4 =		2,2 · 22,4 =		0,38 · 22,4 =	
23	44 · 22,4 =		0,59 · 22,4 =		3,9 · 22,4 =		5,2 · 22,4 =	
24	53 · 22,4 =		0,41 · 22,4 =		4,3 · 22,4 =		53 · 22,4 =	
25	68 · 22,4 =		0,31 · 22,4 =		5,2 · 22,4 =		65 · 22,4 =	
26	75 · 22,4 =		0,22 · 22,4 =		5,4 · 22,4 =		4,4 · 22,4 =	
27	86 · 22,4 =		0,14 · 22,4 =		6,65 · 22,4 =		0,435 · 22,4 =	
28	91 · 22,4 =		0,28 · 22,4 =		8,85 · 22,4 =		32 · 22,4 =	
29	99 · 22,4 =		0,38 · 22,4 =		9,45 · 22,4 =		3,7 · 22,4 =	
30	13 · 22,4 =		0,48 · 22,4 =		6,75 · 22,4 =		9,5 · 22,4 =	
31	25 · 22,4 =		0,54 · 22,4 =		5,95 · 22,4 =		0,965 · 22,4 =	
32	33 · 22,4 =		0,62 · 22,4 =		2,4 · 22,4 =		0,77 · 22,4 =	
33	47 · 22,4 =		0,77 · 22,4 =		3,8 · 22,4 =		0,325 · 22,4 =	
34	67 · 22,4 =		0,88 · 22,4 =		2,25 · 22,4 =		15 · 22,4 =	

KO'PAYTIRUV

Bir adibdan so'rashdi : "Hikmatlarning eng go'zali qaysi ?"
U javob berdi : "Yetmish yildan beri kitob o'qiyman, lekin mana bu so'zdan chiroyliroq so'z topmadim :

Toatning mashaqqati ketadi, ammo savobi qoladi,

Gunohning lazzati ketadi, jazosi qoladi,

Sen o'zing uchun qaysi birini tanlayotganingga boq".

Ko'paytiruv amalining asosi bo'lgan ko'paytirish jadvalini har birimiz yoddan bilishimiz shart !

2	3	4	5
$2 \cdot 2 = 4$	$3 \cdot 2 = 6$	$4 \cdot 2 = 8$	$5 \cdot 2 = 10$
$2 \cdot 3 = 6$	$3 \cdot 3 = 9$	$4 \cdot 3 = 12$	$5 \cdot 3 = 15$
$2 \cdot 4 = 8$	$3 \cdot 4 = 12$	$4 \cdot 4 = 16$	$5 \cdot 4 = 20$
$2 \cdot 5 = 10$	$3 \cdot 5 = 15$	$4 \cdot 5 = 20$	$5 \cdot 5 = 25$
$2 \cdot 6 = 12$	$3 \cdot 6 = 18$	$4 \cdot 6 = 24$	$5 \cdot 6 = 30$
$2 \cdot 7 = 14$	$3 \cdot 7 = 21$	$4 \cdot 7 = 28$	$5 \cdot 7 = 35$
$2 \cdot 8 = 16$	$3 \cdot 8 = 24$	$4 \cdot 8 = 32$	$5 \cdot 8 = 40$
$2 \cdot 9 = 18$	$3 \cdot 9 = 27$	$4 \cdot 9 = 36$	$5 \cdot 9 = 45$

6	7	8	9
$6 \cdot 2 = 12$	$7 \cdot 2 = 14$	$8 \cdot 2 = 16$	$9 \cdot 2 = 18$
$6 \cdot 3 = 18$	$7 \cdot 3 = 21$	$8 \cdot 3 = 24$	$9 \cdot 3 = 27$
$6 \cdot 4 = 24$	$7 \cdot 4 = 28$	$8 \cdot 4 = 32$	$9 \cdot 4 = 36$
$6 \cdot 5 = 30$	$7 \cdot 5 = 35$	$8 \cdot 5 = 40$	$9 \cdot 5 = 45$
$6 \cdot 6 = 36$	$7 \cdot 6 = 42$	$8 \cdot 6 = 48$	$9 \cdot 6 = 54$
$6 \cdot 7 = 42$	$7 \cdot 7 = 49$	$8 \cdot 7 = 56$	$9 \cdot 7 = 63$
$6 \cdot 8 = 48$	$7 \cdot 8 = 56$	$8 \cdot 8 = 64$	$9 \cdot 8 = 72$
$6 \cdot 9 = 54$	$7 \cdot 9 = 63$	$8 \cdot 9 = 72$	$9 \cdot 9 = 81$

Ikki hikmatni yodlab ol :

Birinchisi - g'azabing cho'qqiga chiqqan paytda qaror qabul qilma !

Ikkinchisi - Baxt-saodat cho'qqisida turganingda va'da berma !

MAYDALASH USULI (1)

Ko'paytirish bilan maydalash

Bu usulda ko'paytirish uchun son jihatdan kattaroq bo'lgan sonlarni maydalab ko'paytirish orqali amalga oshiramiz. Misol uchun : $9 = 3 \cdot 3$; $12 = 2 \cdot 2 \cdot 3$

Masalan :

$$1{,}2 \cdot 23{,}5 = 28{,}2$$

1) Demak, bizning masalamizda 1,2 ni 23,5 ga ko'paytirish kerak, ammo bular bir-biriga noqulay sonlar, biz 1,2 ni shartli ravishda 12 deb, tasavvur qilamiz

2) Bizda 12 ni eng kichik maydalangan shakli $2 \cdot 2 \cdot 3$ bo'lgani uchun biz 23,5 ni avval 2 ga, natijani yana 2 ga, so'ng 3 ga ko'paytiramiz

$$23{,}5 \cdot 2 = 47 \;;\; 47 \cdot 2 = 94 \;;\; 94 \cdot 3 = 282$$

$$282 \rightarrow 28{,}2$$

3) Boshida vergulni o'ng tomonga surganimiz uchun endi joyiga qaytaramiz : 282 o'rniga **28,2** bo'ladi

Video tushuntirish

YouTube : Kimyo uchun Matematika "Ko'paytirishda maydalash 1-misol"

MAYDALASH USULI (2)

Qo'shish bilan maydalash

Bu usulda ko'paytirish uchun noqulay bo'lgan sonlarni qulayroq sonlarga maydalash orqali bosqichma–bosqich amalga oshiramiz. Misol uchun : 12 = 10 + 2 ; 9 = 10 - 1

Masalan :

$$1{,}2 \cdot 23{,}5 = 28{,}2$$

$$1{,}2 \cdot 23{,}5 = 28{,}2$$

$$1{,}2 \downarrow 12$$

1) Avval vergulni o'ng tomonga surib, o'zimizga qulay bo'lgan songa aylantirib olamiz.

$$12 = 10 + 2$$

2) Biror bir sonni 12 ga ko'paytrish qiyin bo'lgani uchun 12 ni qulayroq sonlarga maydalaymiz (12 = 10 + 2).

3) 23,5 ni avval 10 ga ko'paytiramiz

4) so'ngra uni 2 ga ko'paytiramiz

$$23{,}5 \cdot 10 = 235 \qquad 23{,}5 \cdot 2 = 47$$

$$235 + 47 = 282$$

5) Boshida vergulni o'ng tomonga surganimiz uchun, endi o'z joyiga qaytaramiz

$$282 \rightarrow 28{,}2$$

Video tushuntirish

YouTube : Kimyo uchun Matematika "Ko'paytirishda maydalash 2-misol"

Ko'paytiruv (·) 1-14 -bosqich

No	1-bosqich		2-bosqich		3-bosqich		4-bosqich		5-bosqich		6-bosqich		7-bosqich	
1	1·3=		2·3=		3·5=		4·7=		5·4=		6·3=		7·4=	
2	1·8=		2·9=		3·8=		4·9=		5·3=		6·8=		7·5=	
3	1·2=		2·5=		3·6=		4·8=		5·9=		6·2=		7·7=	
4	1·5=		2·7=		3·4=		4·1=		5·8=		6·5=		7·3=	
5	1·7=		2·8=		3·7=		4·6=		5·6=		6·7=		7·2=	
6	1·1=		2·4=		3·3=		4·3=		5·1=		6·9=		7·7=	
7	1·4=		2·2=		3·9=		4·7=		5·5=		6·3=		7·5=	
8	1·8=		2·6=		3·2=		4·2=		5·7=		6·5=		7·4=	
9	1·3=		2·1=		3·5=		4·5=		5·4=		6·7=		7·8=	
10	1·6=		2·9=		3·8=		4·9=		5·3=		6·2=		7·9=	
11	1·2=		2·3=		3·1=		4·8=		5·2=		6·4=		7·3=	
12	1·5=		2·5=		3·4=		4·4=		5·9=		6·7=		7·1=	
13	1·8=		2·8=		3·7=		4·6=		5·6=		6·9=		7·8=	
14	1·7=		2·7=		3·3=		4·1=		5·8=		6·8=		7·6=	
15	1·4=		2·4=		3·9=		4·7=		5·7=		6·6=		7·5=	

No	8-bosqich		9-bosqich		10-bosqich		11-bosqich		12-bosqich		13-bosqich		14-bosqich	
1	8·6=		9·3=		10·8=		11·9=		12·9=		13·9=		14·1=	
2	8·7=		9·7=		10·3=		11·3=		12·24=		13·5=		14·5=	
3	8·4=		9·1=		10·9=		11·5=		12·4=		13·7=		14·6=	
4	8·2=		9·6=		10·2=		11·7=		12·6=		13·8=		14·3=	
5	8·7=		9·8=		10·5=		11·5=		12·3=		13·6=		14·2=	
6	8·9=		9·4=		10·3=		11·3=		12·8=		13·3=		14·7=	
7	8·5=		9·2=		10·4=		11·4=		12·5=		13·4=		14·4=	
8	8·8=		9·9=		10·8=		11·9=		12·1=		13·2=		14·8=	
9	8·3=		9·5=		10·5=		11·2=		12·9=		13·5=		14·9=	
10	8·5=		9·3=		10·9=		11·5=		12·4=		13·7=		14·5=	
11	8·2=		9·7=		10·4=		11·3=		12·6=		13·1=		14·3=	
12	8·6=		9·4=		10·2=		11·7=		12·3=		13·6=		14·2=	
13	8·4=		9·8=		10·8=		11·5=		12·2=		13·3=		14·7=	
14	8·8=		9·7=		10·4=		11·9=		12·5=		13·8=		14·4=	
15	8·3=		9·5=		10·7=		11·3=		12·9=		13·9=		14·6=	

Ko'paytiruv (·) 15-28 -bosqich

No	15-bosqich		16-bosqich		17-bosqich		18-bosqich		19-bosqich		20-bosqich		21-bosqich	
1	15·3=		16·4=		17·9=		18·2=		19·5=		20·3=		21·8=	
2	15·4=		16·7=		17·5=		18·5=		19·7=		20·4=		21·6=	
3	15·8=		16·1=		17·6=		18·9=		19·6=		20·7=		21·9=	
4	15·6=		16·6=		17·8=		18·3=		19·8=		20·4=		21·2=	
5	15·7=		16·2=		17·4=		18·6=		19·4=		20·2=		21·7=	
6	15·2=		16·5=		17·7=		18·8=		19·2=		20·9=		21·4=	
7	15·1=		16·9=		17·2=		18·1=		19·9=		20·5=		21·1=	
8	15·9=		16·8=		17·3=		18·4=		19·1=		20·3=		21·3=	
9	15·3=		16·4=		17·1=		18·7=		19·3=		20·7=		21·8=	
10	15·4=		16·7=		17·9=		18·5=		19·7=		20·4=		21·6=	
11	15·5=		16·3=		17·5=		18·2=		19·6=		20·2=		21·9=	
12	15·8=		16·6=		17·6=		18·3=		19·8=		20·8=		21·2=	
13	15·6=		16·2=		17·4=		18·6=		19·5=		20·5=		21·5=	
14	15·7=		16·5=		17·8=		18·8=		19·4=		20·3=		21·7=	
15	15·9=		16·9=		17·2=		18·7=		19·9=		20·9=		21·4=	

No	22-bosqich		23-bosqich		24-bosqich		25-bosqich		26-bosqich		27-bosqich		28-bosqich	
1	22·8=		23·7=		24·7=		25·7=		26·8=		27·6=		28·5=	
2	22·7=		23·5=		24·2=		25·9=		26·2=		27·3=		28·8=	
3	22·4=		23·2=		24·9=		25·5=		26·6=		27·2=		28·7=	
4	22·5=		23·1=		24·3=		25·3=		26·3=		27·4=		28·4=	
5	22·3=		23·4=		24·4=		25·2=		26·4=		27·7=		28·3=	
6	22·9=		23·3=		24·6=		25·8=		26·9=		27·9=		28·2=	
7	22·6=		23·9=		24·4=		25·4=		26·7=		27·8=		28·9=	
8	22·2=		23·8=		24·5=		25·6=		26·8=		27·6=		28·6=	
9	22·8=		23·6=		24·7=		25·9=		26·5=		27·3=		28·8=	
10	22·1=		23·7=		24·2=		25·5=		26·2=		27·2=		28·7=	
11	22·7=		23·2=		24·9=		25·7=		26·3=		27·4=		28·4=	
12	22·4=		23·5=		24·4=		25·3=		26·6=		27·5=		28·3=	
13	22·3=		23·4=		24·6=		25·2=		26·9=		27·9=		28·5=	
14	22·5=		23·9=		24·3=		25·8=		26·7=		27·8=		28·9=	
15	22·6=		23·8=		24·5=		25·4=		26·4=		27·7=		28·2=	

Ko'paytiruv (·) 29-42 -bosqich

No	29-bosqich	30-bosqich	31-bosqich	32-bosqich	33-bosqich	34-bosqich	35 -bosqich
1	29·5=	30·8=	31·7=	32·3=	33·9=	34·3=	35·6=
2	29·9=	30·6=	31·4=	32·7=	33·8=	34·8=	35·4=
3	29·6=	30·4=	31·2=	32·6=	33·5=	34·9=	35·3=
4	29·2=	30·8=	31·5=	32·2=	33·2=	34·7=	35·2=
5	29·8=	30·9=	31·6=	32·9=	33·7=	34·6=	35·9=
6	29·4=	30·3=	31·8=	32·8=	33·3=	34·5=	35·5=
7	29·3=	30·4=	31·9=	32·5=	33·6=	34·2=	35·7=
8	29·7=	30·7=	31·3=	32·3=	33·4=	34·8=	35·8=
9	29·5=	30·5=	31·4=	32·7=	33·8=	34·9=	35·4=
10	29·9=	30·9=	31·7=	32·6=	33·5=	34·6=	35·6=
11	29·6=	30·2=	31·2=	32·9=	33·7=	34·7=	35·2=
12	29·2=	30·9=	31·6=	32·5=	33·3=	34·5=	35·9=
13	29·4=	30·5=	31·8=	32·8=	33·9=	34·4=	35·3=
14	29·3=	30·3=	31·9=	32·4=	33·4=	34·8=	35·5=
15	29·8=	30·7=	31·5=	32·6=	33·8=	34·9=	35·8=

No	36-bosqich	37-bosqich	38-bosqich	39-bosqich	40-bosqich	41-bosqich	42-bosqich
1	36·3=	37·6=	38·5=	39·6=	40·4=	41·4=	42·6=
2	36·4=	37·5=	38·3=	39·8=	40·5=	41·5=	42·9=
3	36·6=	37·2=	38·6=	39·9=	40·2=	41·2=	42·8=
4	36·5=	37·7=	38·7=	39·3=	40·8=	41·9=	42·5=
5	36·8=	37·9=	38·4=	39·4=	40·4=	41·6=	42·7=
6	36·7=	37·8=	38·9=	39·5=	40·9=	41·8=	42·4=
7	36·9=	37·4=	38·8=	39·2=	40·7=	41·7=	42·3=
8	36·3=	37·6=	38·2=	39·6=	40·8=	41·3=	42·6=
9	36·4=	37·5=	38·3=	39·7=	40·5=	41·4=	42·2=
10	36·6=	37·3=	38·5=	39·8=	40·6=	41·5=	42·8=
11	36·2=	37·7=	38·6=	39·9=	40·3=	41·2=	42·5=
12	36·5=	37·9=	38·4=	39·3=	40·4=	41·9=	42·9=
13	36·8=	37·4=	38·8=	39·4=	40·5=	41·6=	42·4=
14	36·9=	37·8=	38·5=	39·5=	40·7=	41·7=	42·3=
15	36·7=	37·6=	38·6=	39·6=	40·2=	41·3=	42·7=

Ko'paytiruv (·) 43-56 -bosqich

No	43-bosqich		44-bosqich		45-bosqich		46-bosqich		47-bosqich		48-bosqich		49-bosqich	
1	43·9=		44·7=		45·7=		46·8=		47·5=		48·7=		49·7=	
2	43·3=		44·5=		45·9=		46·6=		47·2=		48·6=		49·9=	
3	43·5=		44·4=		45·8=		46·2=		47·4=		48·4=		49·5=	
4	43·2=		44·2=		45·4=		46·4=		47·9=		48·8=		49·8=	
5	43·8=		44·8=		45·6=		46·3=		47·7=		48·5=		49·2=	
6	43·4=		44·3=		45·3=		46·5=		47·6=		48·2=		49·3=	
7	43·7=		44·6=		45·2=		46·7=		47·8=		48·3=		49·4=	
8	43·9=		44·9=		45·5=		46·8=		47·3=		48·7=		49·7=	
9	43·6=		44·7=		45·7=		46·2=		47·5=		48·4=		49·6=	
10	43·3=		44·5=		45·8=		46·4=		47·2=		48·8=		49·9=	
11	43·2=		44·2=		45·9=		46·3=		47·4=		48·6=		49·5=	
12	43·8=		44·8=		45·6=		46·5=		47·7=		48·2=		49·8=	
13	43·7=		44·4=		45·3=		46·6=		47·9=		48·5=		49·2=	
14	43·4=		44·3=		45·2=		46·9=		47·8=		48·9=		49·3=	
15	43·6=		44·6=		45·4=		46·8=		47·6=		48·3=		49·4=	

No	50-bosqich		51-bosqich		52-bosqich		53-bosqich		54-bosqich		55-bosqich		56-bosqich	
1	50·5=		51·5=		52·7=		53·6=		54·3=		55·9=		56·4=	
2	50·3=		51·2=		52·3=		53·3=		54·6=		55·2=		56·9=	
3	50·8=		51·8=		52·5=		53·9=		54·9=		55·7=		56·5=	
4	50·5=		51·3=		52·9=		53·6=		54·4=		55·4=		56·3=	
5	50·9=		51·9=		52·3=		53·4=		54·7=		55·6=		56·7=	
6	50·2=		51·6=		52·9=		53·8=		54·5=		55·8=		56·2=	
7	50·8=		51·4=		52·8=		53·3=		54·8=		55·2=		56·8=	
8	50·4=		51·6=		52·7=		53·4=		54·5=		55·4=		56·5=	
9	50·9=		51·9=		52·4=		53·7=		54·6=		55·9=		56·7=	
10	50·3=		51·2=		52·8=		53·5=		54·2=		55·3=		56·4=	
11	50·7=		51·4=		52·5=		53·2=		54·8=		55·5=		56·3=	
12	50·2=		51·6=		52·9=		53·9=		54·5=		55·9=		56·8=	
13	50·6=		51·9=		52·3=		53·4=		54·9=		55·4=		56·2=	
14	50·9=		51·4=		52·9=		53·7=		54·6=		55·6=		56·7=	
15	50·4=		51·8=		52·4=		53·5=		54·7=		55·2=		56·4=	

Ko'paytiruv (·) 57-70 -bosqich

No	57-bosqich		58-bosqich		59-bosqich		60-bosqich		61-bosqich		62-bosqich		63-bosqich	
1	57·2=		58·9=		59·3=		60·7=		61·8=		62·5=		63·3=	
2	57·9=		58·8=		59·2=		60·3=		61·3=		62·3=		63·9=	
3	57·3=		58·7=		59·9=		60·9=		61·4=		62·9=		63·6=	
4	57·8=		58·4=		59·8=		60·5=		61·2=		62·4=		63·2=	
5	57·9=		58·6=		59·4=		60·2=		61·7=		62·6=		63·5=	
6	57·4=		58·5=		59·6=		60·4=		61·6=		62·8=		63·7=	
7	57·5=		58·3=		59·7=		60·6=		61·5=		62·7=		63·4=	
8	57·7=		58·2=		59·3=		60·8=		61·9=		62·2=		63·8=	
9	57·6=		58·8=		59·2=		60·3=		61·8=		62·9=		63·6=	
10	57·3=		58·9=		59·8=		60·9=		61·3=		62·5=		63·9=	
11	57·7=		58·4=		59·4=		60·7=		61·2=		62·8=		63·5=	
12	57·5=		58·7=		59·6=		60·2=		61·7=		62·4=		63·7=	
13	57·6=		58·5=		59·5=		60·5=		61·4=		62·7=		63·3=	
14	57·8=		58·3=		59·9=		60·4=		61·6=		62·3=		63·8=	
15	57·4=		58·6=		59·7=		60·6=		61·5=		62·6=		63·4=	

No	64-bosqich		65-bosqich		66-bosqich		67-bosqich		68-bosqich		69-bosqich		70-bosqich	
1	64·8=		65·9=		66·7=		67·8=		68·5=		69·8=		70·8=	
2	64·5=		65·7=		66·4=		67·4=		68·3=		69·5=		70·6=	
3	64·3=		65·5=		66·6=		67·3=		68·9=		69·7=		70·9=	
4	64·7=		65·3=		66·9=		67·5=		68·4=		69·9=		70·4=	
5	64·9=		65·8=		66·2=		67·7=		68·6=		69·6=		70·7=	
6	64·6=		65·6=		66·5=		67·9=		68·8=		69·2=		70·2=	
7	64·4=		65·4=		66·3=		67·2=		68·7=		69·4=		70·5=	
8	64·2=		65·2=		66·8=		67·6=		68·2=		69·3=		70·3=	
9	64·7=		65·7=		66·6=		67·4=		68·9=		69·9=		70·9=	
10	64·6=		65·3=		66·7=		67·7=		68·5=		69·5=		70·7=	
11	64·3=		65·9=		66·9=		67·8=		68·8=		69·8=		70·5=	
12	64·4=		65·4=		66·5=		67·3=		68·4=		69·4=		70·8=	
13	64·8=		65·8=		66·4=		67·5=		68·7=		69·7=		70·6=	
14	64·5=		65·5=		66·8=		67·9=		68·3=		69·3=		70·4=	
15	64·9=		65·6=		66·3=		67·6=		68·6=		69·6=		70·3=	

Ko'paytiruv (·) 71-84 -bosqich

No	71-bosqich	72-bosqich	73-bosqich	74-bosqich	75-bosqich	76-bosqich	77-bosqich
1	71·9=	72·2=	73·8=	74·3=	75·4=	76·7=	77·8=
2	71·7=	72·5=	73·4=	74·5=	75·9=	76·9=	77·2=
3	71·5=	72·9=	73·9=	74·8=	75·3=	76·6=	77·5=
4	71·4=	72·6=	73·7=	74·7=	75·7=	76·8=	77·7=
5	71·8=	72·3=	73·2=	74·9=	75·2=	76·5=	77·3=
6	71·6=	72·7=	73·5=	74·2=	75·5=	76·3=	77·9=
7	71·2=	72·4=	73·3=	74·4=	75·8=	76·2=	77·6=
8	71·3=	72·8=	73·6=	74·3=	75·6=	76·4=	77·4=
9	71·5=	72·9=	73·9=	74·6=	75·4=	76·6=	77·5=
10	71·7=	72·6=	73·5=	74·8=	75·8=	76·9=	77·8=
11	71·9=	72·5=	73·8=	74·5=	75·5=	76·5=	77·6=
12	71·6=	72·7=	73·7=	74·9=	75·9=	76·7=	77·9=
13	71·8=	72·4=	73·3=	74·4=	75·7=	76·3=	77·7=
14	71·3=	72·8=	73·6=	74·3=	75·3=	76·4=	77·3=
15	71·4=	72·3=	73·4=	74·7=	75·6=	76·8=	77·4=

No	78-bosqich	79-bosqich	80-bosqich	81-bosqich	82-bosqich	83-bosqich	84-bosqich
1	78·6=	79·5=	80·4=	81·7=	82·9=	83·8=	84·7=
2	78·4=	79·9=	80·7=	81·4=	82·8=	83·5=	84·8=
3	78·9=	79·7=	80·3=	81·8=	82·6=	83·4=	84·4=
4	78·3=	79·6=	80·5=	81·9=	82·4=	83·9=	84·9=
5	78·5=	79·8=	80·8=	81·5=	82·7=	83·7=	84·5=
6	78·8=	79·3=	80·6=	81·3=	82·5=	83·6=	84·3=
7	78·2=	79·4=	80·9=	81·6=	82·3=	83·3=	84·2=
8	78·7=	79·2=	80·2=	81·2=	82·2=	83·2=	84·6=
9	78·4=	79·7=	80·3=	81·9=	82·8=	83·5=	84·9=
10	78·9=	79·5=	80·5=	81·7=	82·5=	83·7=	84·5=
11	78·6=	79·9=	80·8=	81·4=	82·7=	83·8=	84·7=
12	78·3=	79·6=	80·6=	81·8=	82·9=	83·4=	84·8=
13	78·5=	79·8=	80·9=	81·6=	82·3=	83·6=	84·3=
14	78·8=	79·4=	80·4=	81·5=	82·6=	83·9=	84·6=
15	78·7=	79·3=	80·7=	81·3=	82·4=	83·3=	84·4=

Ko'paytiruv (·) 85-98 -bosqich														
No	85-bosqich		86-bosqich		87-bosqich		88-bosqich		89-bosqich		90-bosqich		91-bosqich	
1	85·9=		86·6=		87·9=		88·2=		89·7=		90·7=		91·4=	
2	85·4=		86·2=		87·7=		88·8=		89·9=		90·4=		91·8=	
3	85·8=		86·7=		87·4=		88·7=		89·8=		90·9=		91·3=	
4	85·7=		86·4=		87·6=		88·5=		89·2=		90·6=		91·6=	
5	85·3=		86·9=		87·2=		88·3=		89·3=		90·8=		91·9=	
6	85·2=		86·5=		87·5=		88·9=		89·6=		90·5=		91·2=	
7	85·6=		86·3=		87·9=		88·5=		89·4=		90·2=		91·5=	
8	85·5=		86·8=		87·8=		88·4=		89·7=		90·3=		91·7=	
9	85·3=		86·7=		87·3=		88·6=		89·5=		90·8=		91·8=	
10	85·8=		86·5=		87·7=		88·7=		89·9=		90·4=		91·4=	
11	85·9=		86·9=		87·9=		88·8=		89·8=		90·9=		91·6=	
12	85·5=		86·8=		87·6=		88·9=		89·6=		90·5=		91·9=	
13	85·7=		86·4=		87·5=		88·5=		89·3=		90·7=		91·5=	
14	85·4=		86·6=		87·4=		88·3=		89·7=		90·6=		91·7=	
15	85·6=		86·3=		87·3=		88·4=		89·4=		90·3=		91·8=	
No	92-bosqich		93-bosqich		94-bosqich		95-bosqich		96-bosqich		97-bosqich		98-bosqich	
1	92·3=		93·9=		94·5=		95·2=		96·8=		97·2=		98·3=	
2	92·2=		93·2=		94·7=		95·4=		96·6=		97·4=		98·2=	
3	92·8=		93·5=		94·3=		95·7=		96·5=		97·6=		98·7=	
4	92·5=		93·8=		94·2=		95·3=		96·7=		97·8=		98·8=	
5	92·9=		93·6=		94·9=		95·6=		96·3=		97·9=		98·6=	
6	92·7=		93·7=		94·4=		95·8=		96·2=		97·5=		98·9=	
7	92·6=		93·4=		94·8=		95·9=		96·4=		97·7=		98·4=	
8	92·3=		93·3=		94·6=		95·4=		96·9=		97·3=		98·3=	
9	92·4=		93·5=		94·5=		95·5=		96·8=		97·4=		98·7=	
10	92·8=		93·9=		94·3=		95·7=		96·5=		97·6=		98·5=	
11	92·5=		93·6=		94·7=		95·6=		96·6=		97·8=		98·8=	
12	92·9=		93·7=		94·9=		95·8=		96·7=		97·5=		98·6=	
13	92·7=		93·8=		94·4=		95·9=		96·3=		97·7=		98·4=	
14	92·3=		93·4=		94·8=		95·4=		96·4=		97·9=		98·9=	
15	92·4=		93·5=		94·6=		95·5=		96·9=		97·3=		98·7=	

BO'LUV

Yog'och mixga: "Meni sindirding-ku ?!", - dedi

Shunda mix: "Agar sen boshim ustidan urushganini ko'rganingda edi, meni tushungan bo'lar eding", - deb javob berdi.

Gohida biz bilmagan uzrlar sababli bir-birimizni tushunib, ma'zur tutishimiz qanchalar go'zal !

MAYDALASH USULI (1)

Ko'paytirish bilan maydalash

Bu usulda bo'lish uchun son jihatdan kattaroq bo'lgan sonlarni maydalab bo'lish orqali amalga oshiramiz. Misol uchun : $9 = 3 \cdot 3$; $12 = 3 \cdot 2 \cdot 2$

Masalan :

$$\frac{27{,}2}{8} = 3{,}4$$

1) Demak, bizning masalamizda 27,2 ni 8 ga bo'lishimiz kerak, ammo bular bir-biriga noqulay sonlar bo'lgani uchun 27,2 ni 272 deb tasavvur qilamiz

2) Bizda 8 ni eng kichik maydalangan shakli $2 \cdot 2 \cdot 2$ bo'lgani uchun biz 27,2 ni avval 2 ga, so'ng 2 ga, keyin esa yana 2 ga bo'lamiz.

$$\frac{272}{2} = 136\ ;\ \frac{136}{2} = 68\ ;\ \frac{68}{2} = 34$$

$$34 \rightarrow 3{,}4$$

3) Vergulni o'ng tomonga surganimiz uchun endi joyiga qaytaramiz, 34 o'rniga **3,4** bo'ladi

Video tushuntirish

YouTube : Kimyo uchun Matematika "Bo'lishda maydalash 1-misol"

MAYDALASH USULI (2)

Qo'shish bilan maydalash

Bu usulda bo'lish uchun noqulay bo'lgan sonlarni bo'lish qulay bo'lgan sonlarga aylantirib olamiz.
Misol uchun : 14,8/4 = 12 + 2,8 → 4 ga bo'lishga qulay sonlar

Masalan :

$$\frac{27,2}{8} = 3,4$$

$$27,2 \,/\, 8$$

$$24 + 3,2$$

1) 27,2 ni 8 ga bo'lish uchun qulay bo'lgan ikkita songa aylantiramiz.

$$\frac{24}{8} = 3 \qquad \frac{3,2}{8} = 0,4$$

2) Har ikkala sonni alohida 8 ga bo'lib olamiz,

$$3 + 0,4 = 3,4$$

3) Oxirida chiqqan sonlarni bir-biriga qo'shib qo'yamiz.

Video tushuntirish → **YouTube** : Kimyo uchun Matematika "Bo'lishda maydalash 2-misol"

Bo'luv (/) 1-10 -bosqich

No	1-bosqich		2-bosqich		3-bosqich		4-bosqich		5-bosqich	
1	16/4 =		24/4 =		30/6 =		56/8 =		110/10 =	
2	20/5 =		30/6 =		45/5 =		88/8 =		140/14 =	
3	12/4 =		28/7 =		42/6 =		48/8 =		132/12 =	
4	9/3 =		20/4 =		63/9 =		60/6 =		156/12 =	
5	25/5 =		36/6 =		54/6 =		90/10 =		120/8 =	
6	15/5 =		42/7 =		48/6 =		70/10 =		120/10 =	
7	15/3 =		49/7 =		45/9 =		99/9 =		126/9 =	
8	20/5 =		20/5 =		81/9 =		54/9 =		99/11 =	
9	12/3 =		24/6 =		56/8 =		81/9 =		90/10 =	
10	20/4 =		42/6 =		64/8 =		88/11 =		90/10 =	
11	12/4 =		25/5 =		48/8 =		48/6 =		144/12 =	
12	16/4 =		24/4 =		40/5 =		90/9 =		104/8 =	
13	25/5 =		20/4 =		36/6 =		60/10 =		96/8 =	
14	9/3 =		42/7 =		56/7 =		66/11 =		77/11 =	
15	15/3 =		36/6 =		63/7 =		96/12 =		56/7 =	
No	6-bosqich		7-bosqich		8-bosqich		9-bosqich		10-bosqich	
1	96/4 =		15/6 =		2,16/4 =		6,88/8 =		34,8/6 =	
2	204/6 =		13,6/4 =		6,08/8 =		27,6/6 =		31,2/8 =	
3	408/8 =		65,6/8 =		3,36/8 =		10,4/2 =		3,88/4 =	
4	150/6 =		21,2/4 =		0.9/2 =		67,2/8 =		4,72/8 =	
5	56/4 =		9,4/2 =		5,84/8 =		128/4 =		312/12 =	
6	144/6 =		15/6 =		2.28/4 =		2,16/6 =		2,82/6 =	
7	336/8 =		74,7/9 =		3,76/8 =		168/12 =		31,6/4 =	
8	192/12 =		61,2/12 =		3,04/8 =		152/4 =		5,28/12 =	
9	180/10 =		43,8/6 =		3,84/8 =		4,24/8 =		30,4/8 =	
10	96/4 =		47,2/8 =		5,22/6 =		18,4/2 =		38/4 =	
11	488/8 =		14,4/4 =		3,76/4 =		16,8/6 =		4,5/6 =	
12	198/6 =		78/12 =		3,52/8 =		328/8 =		5,28/12 =	
13	212/4 =		12,8/4 =		3,08/4 =		2,56/4 =		13,8/6 =	
14	230/10 =		49,6/8 =		3,68/8 =		45,6/8 =		45,6/8 =	
15	152/8 =		21/6 =		1,48/4 =		76/4 =		292/4 =	

QULAY SON

Biro'vlarning jarohatlari ustidan kulma...

- kambag'al huzurida boyligingni gapirma;
- bemorning huzurida sog'ligingni gapirma;
- kuchsizning huzurida, kuching haqida gapirma;
- baxtsizning huzurida baxting haqida gapirma;
- maxbusning huzurida erkinliging gapirma;
- bepushtning huzurida fanzandingni gapirma;
- yetimning huzurida otang haqida gapirma.

Ularni jarohatlari ustidan kulgan saring, alamlari ortadi, va o'z johilliging sabab ularni tiriklayin go'rga tiqasan

Quydagi bir biri o'rniga almashtirib qo'llash mumkin bo'lgan sonlarni yod oling !

Butun	Yaxlit	Kasr
0.1	10	$\frac{1}{10}$
0.125	8	$\frac{1}{8}$
0.15	6.667	$\frac{3}{20}$
0.2	5	$\frac{1}{5}$
0.25	4	$\frac{1}{4}$
0.3	3.333	$\frac{3}{10}$
0.333	3	$\frac{1}{3}$

Butun	Yaxlit	Kasr
0.4	2.5	$\frac{2}{5}$
0.5	2	$\frac{1}{2}$
0.6	1.667	$\frac{3}{5}$
0.667	1.5	$\frac{2}{3}$
0.75	1.33	$\frac{3}{4}$
0.8	1.25	$\frac{4}{5}$
0.9	1.111	$\frac{9}{10}$

Pulingga ...

- uy sotib olarsan, xotirjamlik emas,
- lavozim sotib olarsan, hurmatni emas,
- to'shak sotib olarsan, uyquni emas,
- kitob sotib olarsan, fahmni emas,
- dori sotib olarsan, shifoni emas.

Bir-biri o'rniga almashtirib ishlatish mumkin bo'lgan sonlar

Bu sonlar kimyo fanida ko'p ishlatiladigan sonlar bo'lgani uchun biri o'rniga boshqasini qo'llash mumkin. Faqatgina ishorasini (× / ÷) o'zgartirib qo'llanadi

Masalan :

$$60 \cdot 0{,}25 = 15 \quad \text{o'rniga} \quad \frac{60}{4} = 15$$

1) 60 ni 0,25 ga ko'paytrish nisbatan qiyinroq bo'lgani uchun,

2) 0,25 ga ko'paytrish o'rniga 4 ga bo'lamiz.

$$\frac{8}{0{,}333} = 24 \quad \text{o'rniga} \quad 8 \cdot 3 = 24$$

1) 8 ni 0,333 ga bo'lish nisbatan qiyinroq bo'lgani uchun,

2) 0,333 ga bo'lish o'rniga 3 ga ko'paytiramiz.

$$24 \cdot 0{,}75 = 18 \quad \text{o'rniga} \quad 24 \cdot \frac{3}{4} = 18$$

1) 24 ni 0,75 ga ko'paytrish nisbatan qiyinroq bo'lgani uchun,

2) 24 ni 3 ga ko'paytirib 4 ga bo'lamiz.

Video tushuntirish → **YouTube** : Kimyo uchun Matematika “Qulay sonlarga aylantirish”

Qulay son 1-3 -bosqich

No	1-bosqich			2-bosqich			3-bosqich		
1	$30 \cdot 0{,}5 =$	$\frac{30}{\dots\dots} =$		$\frac{30}{5} =$	$30 \cdot \dots\dots =$		$\frac{500}{50} =$	$50 \cdot \dots\dots\dots\dots =$	
2	$23 \cdot 0{,}5 =$	$\frac{23}{\dots\dots} =$		$\frac{12{,}5}{0{,}25} =$	$12{,}5 \cdot \dots\dots =$		$\frac{128}{0{,}025} =$	$128 \cdot \dots\dots\dots\dots =$	
3	$45 \cdot 0{,}33 =$	$\frac{45}{\dots\dots} =$		$\frac{17}{0{,}2} =$	$17 \cdot \dots\dots =$		$\frac{45}{0{,}02} =$	$45 \cdot \dots\dots\dots\dots =$	
4	$250 \cdot 0{,}25 =$	$\frac{250}{\dots\dots} =$		$\frac{24{,}5}{0{,}25} =$	$24{,}5 \cdot \dots\dots =$		$\frac{44{,}5}{2{,}5} =$	$44{,}5 \cdot \dots\dots\dots\dots =$	
5	$25{,}5 \cdot 2 =$	$\frac{25{,}5}{\dots\dots} =$		$\frac{63}{0{,}5} =$	$63 \cdot \dots\dots =$		$\frac{63}{5} =$	$63 \cdot \dots\dots\dots\dots =$	
6	$47 \cdot 5 =$	$\frac{47}{\dots\dots} =$		$\frac{98}{8} =$	$98 \cdot \dots\dots =$		$\frac{40}{0{,}08} =$	$40 \cdot \dots\dots\dots\dots =$	
7	$4 \cdot 10 =$	$\frac{4}{\dots\dots} =$		$\frac{233}{5} =$	$233 \cdot \dots\dots =$		$\frac{400}{0{,}5} =$	$400 \cdot \dots\dots\dots\dots =$	
8	$90 \cdot 1{,}33 =$	$\frac{90}{\dots\dots} =$		$\frac{142}{8} =$	$142 \cdot \dots\dots =$		$\frac{322}{80} =$	$322 \cdot \dots\dots\dots\dots =$	
9	$40 \cdot 7{,}5 =$	$\frac{40}{\dots\dots} =$		$\frac{189}{9} =$	$189 \cdot \dots\dots =$		$\frac{135}{0{,}09} =$	$135 \cdot \dots\dots\dots\dots =$	
10	$4{,}4 \cdot 9 =$	$\frac{4{,}4}{\dots\dots} =$		$\frac{216}{25} =$	$216 \cdot \dots\dots =$		$\frac{125}{250} =$	$125 \cdot \dots\dots\dots\dots =$	
11	$30 \cdot 0{,}3 =$	$\frac{30}{\dots\dots} =$		$\frac{108}{8} =$	$108 \cdot \dots\dots =$		$\frac{216}{0{,}8} =$	$216 \cdot \dots\dots\dots\dots =$	
12	$25 \cdot 0{,}15 =$	$\frac{25}{\dots\dots} =$		$\frac{27}{3} =$	$27 \cdot \dots\dots =$		$\frac{330}{3} =$	$330 \cdot \dots\dots\dots\dots =$	
13	$45 \cdot 0{,}33 =$	$\frac{45}{\dots\dots} =$		$\frac{62}{40} =$	$62 \cdot \dots\dots =$		$\frac{660}{4} =$	$660 \cdot \dots\dots\dots\dots =$	
14	$24 \cdot 8 =$	$\frac{24}{\dots\dots} =$		$\frac{46}{4} =$	$46 \cdot \dots\dots =$		$\frac{51}{4} =$	$51 \cdot \dots\dots\dots\dots =$	
15	$6{,}25 \cdot 6 =$	$\frac{6{,}25}{\dots\dots} =$		$\frac{78}{0{,}75} =$	$78 \cdot \dots\dots =$		$\frac{78}{0{,}75} =$	$90 \cdot \dots\dots\dots\dots =$	
16	$56 \cdot 8 =$	$\frac{56}{\dots\dots} =$		$\frac{174}{1{,}11} =$	$174 \cdot \dots\dots =$		$\frac{66{,}6}{111} =$	$66{,}6 \cdot \dots\dots\dots\dots =$	
17	$35 \cdot 0{,}8 =$	$\frac{35}{\dots\dots} =$		$\frac{83{,}2}{0{,}4} =$	$83{,}2 \cdot \dots\dots =$		$\frac{5000}{40} =$	$5000 \cdot \dots\dots\dots\dots =$	
18	$89 \cdot 0{,}9 =$	$\frac{89}{\dots\dots} =$		$\frac{84{,}8}{0{,}8} =$	$84{,}8 \cdot \dots\dots =$		$\frac{4000}{8000} =$	$400 \cdot \dots\dots\dots\dots =$	
19	$78 \cdot 2{,}5 =$	$\frac{78}{\dots\dots} =$		$\frac{75{,}6}{0{,}4} =$	$75{,}6 \cdot \dots\dots =$		$\frac{440}{40} =$	$440 \cdot \dots\dots\dots\dots =$	
20	$80 \cdot 4 =$	$\frac{80}{\dots\dots} =$		$\frac{39{,}2}{0{,}2} =$	$39{,}2 \cdot \dots\dots =$		$\frac{3{,}26}{0{,}002} =$	$3{,}92 \cdot \dots\dots\dots\dots =$	

Qulay son 3-6 -bosqich

No	4-bosqich		5-bosqich		6-bosqich		7-bosqich	
1	$\frac{25}{0,133} =$		25 · 6 =		$\frac{45}{2}$		$\frac{450}{4}$	
2	$\frac{0,9}{0,111} =$		100 · 0,4 =		$\frac{300}{3}$		$\frac{12}{0,3}$	
3	$\frac{45}{0,67} =$		125 · 0,75 =		$\frac{50}{4}$		$\frac{550}{11}$	
4	$\frac{8}{0,125} =$		78 · 0,67 =		45 · 0,15 =		320 · 0,25 =	
5	$\frac{6}{0,167} =$		126 · 0,22 =		$\frac{34}{0,5}$		$\frac{240}{8}$	
6	$\frac{9,8}{0,233} =$		16,67 · 3 =		93 · 0,33 =		960 · 0,33 =	
7	$\frac{80}{0,11} =$		19,95 · 0,33 =		14 · 8 =		15 · 0,2 =	
8	$\frac{63,33}{3,33} =$		18,75 · 2,67 =		$\frac{85}{0,2} =$		$\frac{200}{0,67} =$	
9	$\frac{45,33}{0,33} =$		0,4 · 0,75 =		6,67 · 6 =		44 · 2,5 =	
10	$\frac{25}{0,1} =$		300 · 1,25 =		$\frac{3}{0,1}$		$\frac{35}{0,2}$	
11	$\frac{1,6}{0,25} =$		255 · 0,3 =		8 · 8 =		8 · 0,75 =	
12	$\frac{16,33}{1,33} =$		400 · 0,25 =		$\frac{90}{0,75} =$		$\frac{160}{0,8} =$	
13	$\frac{78}{2,67} =$		21,25 · 0,4 =		12 · 0,8 =		45 · 0,33 =	
14	$\frac{3,5}{0,2} =$		18,33 · 0,6 =		30 · 0,9 =		0,05 · 90 =	
15	$\frac{18,9}{0,3} =$		7,75 · 0,8 =		$\frac{4,6}{0,133} =$		$\frac{6,02}{0,25} =$	
16	$\frac{48}{0,4} =$		12,7 · 0,5 =		4 · 2,5 =		6,02 · 2,5 =	
17	$\frac{27}{0,75} =$		33,9 · 0,33 =		9 · 4 =		9,03 · 0,5 =	
18	$\frac{90}{16,67} =$		64 · 0,75 =		450 · 0,133 =		150 · 0,025 =	
19	$\frac{45}{75} =$		4,8 · 0,4 =		$\frac{28}{0,11} =$		$\frac{27}{0,3} =$	
20	$\frac{45}{15} =$		42 · 3 =		$\frac{44}{3,33} =$		$\frac{160}{0,67} =$	

YAXLITLAB KO'PAYTIRISH

Faqih bir odamni bir qabr ustida yig'layotganini ko'rib undan so'radilar : "Nima uchun yig'layabsan ?"

u javob berdi : "Yahshi ko'rgan insonim meni tashlab ketdi, shuning uchun yig'layabman".

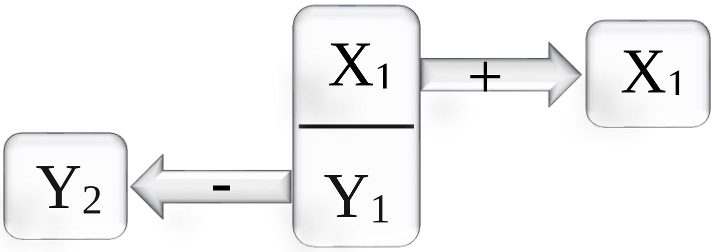
Faqih : "Sening muammoing, bir kun o'lishi aniq bo'lgan kimsani yahshi ko'rganing ekan, agar doimo tirik va hech qachon o'lmaydigan zotni yahshi ko'rganingda edi, u seni hech qachon tashlab ketmagan bo'lardi".

YAXLITLASH USULI

Bu usuldan savolning oxirida yuqorida o'rgatilgan usullar foyda bermagan holatda ishlatiladi. Bu usul o'zida tezlik va qulaylikni mujassam qilib, aniq son chiqishini talab qilmaydi.
1) Bu usulda yaxlitlash qanchalik aniq bo'lsa, chiqqan javob ham to'g'ri javobga shuncha yaqin bo'ladi.
2) Yaxlitlash qanchalik kichik son qiymatga o'zgartirilsa, javob shunchalik aniq bo'ladi.
Misol uchun : asl javob **3,665** bo'lsa, bizning javob **3,6** yoki **3,7** bo'lishi mumkin

Ko'paytirish qoidasi

Bunda yaxlitlash har-xil tomonga bo'ladi, ya'ni yaxlitlash uchun birinchi songa (shartli ravishda) qaysi raqamni qo'shsak, ikkinchi sondan shunday nisbatda ayiramiz, agar birinchi sondan ayirsak ikkinchi songa shunday nisbatda qo'shamiz. Faqat ikkinchi sondagi o'zgarish har ikki (birinchi va ikkinchi) sonning o'zaro nisbatiga to'g'ri kelishi kerak.



Masalan (1) :

$$33 \cdot 22 = 726$$

$$33 \cdot 22 =$$

+ 3   − 2

$$36 \cdot 20 =$$

1) 22 ga ko'paytirish bizga noqulay son bo'lgani uchun, 22 dan **2** ni ayirib 20 ga aylantirib olamiz

2) Biz 22 dan 2 ni ayirgan edik, endi 33 soni 22 dan 1,5 barobar (33/22) kichik bo'lgani uchun, 2 dan taxminan 1,5 barobar katta bo'lgan sonni, ya'ni **3** ni 33 ga qo'shamiz va **36** deb olamiz.

$$720 \approx 726$$

3) Bizda chiqqan 720 soniga → 726 juda yaqin son bo'lgani uchun javobga qabul qilamiz.

Video tushuntirish

YouTube : Kimyo uchun Matematika "Ko'paytirishda yaxlitlash 1-misol"

Masalan (2) :

$$14{,}5 \cdot 4{,}8 = 69{,}6$$

$$14{,}5 \cdot 4{,}8 =$$

2) Bu yerda ham vergulni o'ng tomonga surib, qulaylashtirib olamiz

1) 4,8 bizga qiyin son bo'lgani uchun vergulni o'ng tarafga surib, osonroq songa aylantirib olamiz.

$$145 \cdot 48 =$$

-6 $\quad$ $+2$

$$139 \cdot 50 \approx$$

4) Biz 48 ga 2 ni qo'shgan edik, endi 48 soni 145 dan taxminan 3 barobar katta bo'lgani uchun, 2 dan 3 barobar katta bo'lgan sonni, ya'ni **6** ni 145 dan ayiramiz va **139** deb olamiz.

3) 48 ga ko'paytirish bizga noqulay son bo'lgani uchun 48 ga **2** ni qo'shib, **50** ga aylantirib olamiz

$$\approx 6950 \to 69{,}5$$

5) 139 ni 50 ga ko'paytirish qiyinlik qilsa, uni 2 ga bo'lib, ikkita vergul suramiz.
139 / 2 = 69,5 → **6950**

6) Boshida ikkala sondan bittadan ikkita vergul o'ng tomonga surib olganimiz uchun vergulni yana orqaga qaytaramiz

$$69{,}5 \approx 69{,}6$$

7) Bizda chiqqan 69,5 → 69,6 ga juda yaqin son bo'lgani uchun javobga qabul qilamiz.

Eslatma : ko'paytirishda yaxlitlash amalini qaysi son (birinchi yoki ikkinchi son) dan boshlash ahamyatsiz, muhumi qulay songacha aylantirib olish

Video tushuntirish

YouTube : Kimyo uchun Matematika "Ko'paytirishda yaxlitlash 2-misol"

Ko'paytiruv (·) 1-5 -bosqich

№	1-bosqich		2-bosqich		3-bosqich		4-bosqich		5-bosqich	
1	1,4 · 5,2 =		3,3 · 2,6 =		13,3 · 2,6 =		13,3 · 24 =		3,2 · 27 =	
2	1,4 · 3,7 =		1,4 · 4,9 =		12,4 · 4,9 =		12,4 · 48 =		1,4 · 39 =	
3	7,9 · 5,6 =		5,6 · 5,6 =		25,6 · 5,6 =		25,6 · 55 =		7,9 · 55 =	
4	2,9 · 8,6 =		2,9 · 7,1 =		32,9 · 7,1 =		32,9 · 72 =		2,9 · 87 =	
5	4,4 · 5,8 =		9,9 · 5,8 =		19,9 · 5,8 =		19,9 · 54 =		4,4 · 56 =	
6	2,3 · 4,9 =		2,3 · 4,4 =		42,3 · 4,4 =		42,3 · 42 =		2,3 · 42 =	
7	7,9 · 1,8 =		9,4 · 1,8 =		59,4 · 1,8 =		59,4 · 18 =		7,9 · 19 =	
8	6,6 · 5,4 =		6,6 · 4,4 =		66,6 · 4,4 =		66,6 · 42 =		6,6 · 55 =	
9	2,2 · 3,7 =		1,2 · 3,7 =		22,4 · 3,7 =		22,4 · 35 =		2,2 · 38 =	
10	9,9 · 1,8 =		9,9 · 2,3 =		79,9 · 2,3 =		79,9 · 24 =		9,9 · 19 =	
11	6,5 · 5,8 =		3,3 · 5,8 =		73,3 · 5,8 =		73,3 · 52 =		6,5 · 55 =	
12	1,3 · 4,5 =		1,3 · 3,4 =		83,3 · 3,4 =		83,3 · 38 =		1,3 · 44 =	
13	2,6 · 5,6 =		4,5 · 5,6 =		89,6 · 5,6 =		89,6 · 55 =		2,6 · 55 =	
14	3,6 · 7,8 =		3,6 · 5,6 =		33,6 · 5,6 =		33,6 · 53 =		3,6 · 80 =	
15	4,8 · 7,8 =		6,7 · 7,8 =		67,7 · 7,8 =		67,7 · 79 =		4,8 · 74 =	
16	6,4 · 4,6 =		6,4 · 6,7 =		26,4 · 6,7 =		26,4 · 62 =		6,4 · 46 =	
17	9,8 · 7,4 =		8,8 · 7,4 =		24,6 · 7,4 =		24,6 · 72 =		9,8 · 75 =	
18	7,3 · 3,6 =		7,3 · 9,4 =		37,3 · 9,4 =		37,3 · 92 =		7,3 · 35 =	
19	4,8 · 3,4 =		4,1 · 3,4 =		44,1 · 3,4 =		44,1 · 31 =		4,8 · 32 =	
20	7,6 · 1,3 =		7,6 · 3,2 =		37,6 · 3,2 =		37,6 · 39 =		7,6 · 15 =	
21	5,6 · 7,8 =		9,5 · 7,8 =		49,5 · 7,8 =		49,5 · 77 =		5,6 · 75 =	
22	6,7 · 8,9 =		6,7 · 8,4 =		56,7 · 8,4 =		56,7 · 85 =		6,7 · 88 =	
23	1,2 · 2,3 =		7,5 · 2,3 =		77,5 · 2,3 =		77,5 · 25 =		1,2 · 24 =	
24	3,4 · 4,4 =		3,4 · 7,4 =		83,4 · 7,4 =		83,4 · 76 =		3,4 · 45 =	
25	5,5 · 6,6 =		6,4 · 6,6 =		96,4 · 6,6 =		96,4 · 67 =		5,5 · 65 =	
26	2,3 · 2,3 =		2,3 · 2,3 =		11,3 · 2,3 =		11,3 · 27 =		2,3 · 25 =	
27	7,7 · 8,8 =		1,3 · 9,4 =		21,3 · 9,4 =		21,3 · 99 =		7,7 · 85 =	
28	6,5 · 7,9 =		5,5 · 7,9 =		35,5 · 7,9 =		35,5 · 78 =		6,5 · 75 =	
29	2,3 · 4,6 =		2,3 · 3,4 =		4,3 · 3,4 =		4,3 · 31 =		2,3 · 46 =	
30	6,4 · 5,4 =		6,4 · 5,4 =		7,4 · 5,4 =		7,4 · 56 =		6,4 · 56 =	

YAXLITLAB BO'LISH

Bir hakimdan : "Nima uchun sizga yomonlik qilishsa ham yahshilik qilaverasiz ?" deb so'rashdi.

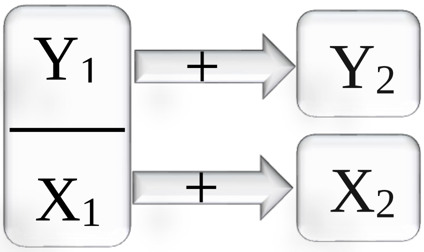
U : "Yahshiligim bilan uning hayotini afzal, o'zimning kunimni go'zal, tamoyillarimni kuchli, ruhimni toza, nafsimni musaffo qilaman", deb javob berdi.

YAXLITLASH USULI

Bu usuldan savolning oxirida yuqorida o'rgatilgan usullar foyda bermagan holatlarda ishlatiladi. Bu usul o'zida tezlik va qulaylikni mujassam qilib, aniq son chiqishini talab qilmaydi.
1) Bu usulda yaxlitlash qanchalik aniq bo'lsa, chiqqan javob ham to'g'ri javobga shuncha yaqin bo'ladi.
2) Yaxlitlash qanchalik kichik son qiymatga o'zgartirilsa, javob shunchalik aniq bo'ladi.
Misol uchun : asl javob **3,665** bo'lsa, bizning javob **3,6** yoki **3,7** bo'lishi mumkin.

Bo'lish qoidasi

Bunda yaxlitlash bir tomonga bo'ladi, yani yaxlitlash uchun maxrajdagi songa qaysi sonni qo'shsak yoki ayirsak, suratdagi songa ham shunday nisbatda qo'shamiz yoki ayiramiz. Faqat ikkinchi sondagi o'zgarish har ikki sonning o'zaro nisbatiga to'g'ri kelishi kerak.



Masalan (1) :

$$\frac{54,8}{11,3} = 4,85$$

$$\frac{54,8}{11,3} \approx \frac{48,3}{10} \approx 4,83$$

1) 11,3 ni biz uchun qulay bo'lgan songa yaxlitlash maqsadida undan **1,3** ni ayiramiz va bizga qulay bo'lgan 10 sonini olamiz.

– 1,3

2) Maxrajdagi sondan 1,3ni qo'shgan edik, endi 54,8 soni 11,3 dan taxminan 5 marta katta bo'lgani uchun…

3) 1,3 dan 5 marta katta bo'lgan sonni, ya'ni **6,5** ni olamiz .

– 6,5

4) Bizda 4,85 ga juda yaqin bo'lgan son ya'ni **4,83** chiqdi. Demak, javobimiz haqiqiy songa juda ham yaqin.

Video tushuntirish

YouTube : Kimyo uchun Matematika "Bo'lishda yaxlitlash 1-misol"

Masalan (2) :

$$\frac{58,7}{14} = 4,1928$$

3) 1 dan taxminan to'rt marta katta bo'lgan sonni, yani 4 ni yoki qulayroq bo'lishi uchun **4,3** ni olamiz .

2) Maxrajdagi songa 1 ni qo'shgan edik, endi 58,7 soni 14 dan tahminam 4 marta katta bo'lgani uchun…

+ 4,3

$$\frac{58,7}{14} \approx \frac{63}{15} \approx$$

+ 1

1) 14 ni biz uchun qulay bo'lgan songa yaxlitlash maqsadida unga **1** ni qo'shamiz va bizga qulay bo'lgan 15 sonini olamiz.

4) 63 ni 15 ga bo'lish ham bizga qiyinroq bo'lishi mumkin

6) 126 ni 3 ga bo'lish qiyinlik qilsa, uni ham maydalangan holda, avval 120 / 30 = **4** ; 0,6 / 3 = **0,2** ; so'ngra 4 + 0,2 = 4,2

$$\approx \frac{63}{15} \approx \frac{63 \cdot 2}{30} \approx \frac{126}{30} \approx 4,2$$

5) Shuning uchun biz oldin o'rgangan bir-birining o'rniga qo'yish mumkin bo'lgan sonlar ichidan 15 ni o'rniga $\frac{2}{3}$ ni olamiz va 63 ni 2 ga ko'paytirib, so'ng 3 (30) ga bo'lamiz

7) Bizdagi 4,19 ga yaqin son, yani **4,2**

Video tushuntirish → **YouTube** : Kimyo uchun Matematika "Bo'lishda yaxlitlash 2-misol"

Bo'luv (/) 1-5 -bosqich

№	1-bosqich		2-bosqich		3-bosqich		4-bosqich		5-bosqich	
1	$\frac{54}{28}\approx$		$\frac{47}{2{,}8}\approx$		$\frac{28}{76}\approx$		$\frac{74}{0{,}27}\approx$		$\frac{43{,}4}{18{,}3}\approx$	
2	$\frac{63}{28}\approx$		$\frac{64}{3{,}5}\approx$		$\frac{35}{73}\approx$		$\frac{45}{0{,}32}\approx$		$\frac{87{,}4}{32{,}5}\approx$	
3	$\frac{94}{36}\approx$		$\frac{83}{6{,}2}\approx$		$\frac{36}{82}\approx$		$\frac{36}{0{,}53}\approx$		$\frac{93{,}4}{15{,}4}\approx$	
4	$\frac{82}{57}\approx$		$\frac{76}{8{,}4}\approx$		$\frac{53}{94}\approx$		$\frac{24}{0{,}16}\approx$		$\frac{82{,}6}{23{,}3}\approx$	
5	$\frac{74}{26}\approx$		$\frac{63}{4{,}6}\approx$		$\frac{34}{84}\approx$		$\frac{63}{0{,}32}\approx$		$\frac{94{,}2}{18{,}4}\approx$	
6	$\frac{78}{17}\approx$		$\frac{92}{5{,}2}\approx$		$\frac{24}{73}\approx$		$\frac{44}{0{,}87}\approx$		$\frac{73{,}4}{19{,}4}\approx$	
7	$\frac{62}{26}\approx$		$\frac{78}{7{,}4}\approx$		$\frac{35}{84}\approx$		$\frac{67}{0{,}43}\approx$		$\frac{69{,}7}{24{,}1}\approx$	
8	$\frac{58}{34}\approx$		$\frac{39}{5{,}2}\approx$		$\frac{55}{76}\approx$		$\frac{23}{0{,}47}\approx$		$\frac{99{,}5}{46{,}3}\approx$	
9	$\frac{45}{24}\approx$		$\frac{59}{3{,}7}\approx$		$\frac{56}{97}\approx$		$\frac{18}{0{,}53}\approx$		$\frac{67{,}4}{34{,}6}\approx$	
10	$\frac{93}{47}\approx$		$\frac{91}{7{,}4}\approx$		$\frac{14}{57}\approx$		$\frac{27}{0{,}34}\approx$		$\frac{98{,}3}{22{,}6}\approx$	
11	$\frac{67}{19}\approx$		$\frac{88}{5{,}3}\approx$		$\frac{37}{83}\approx$		$\frac{22}{0{,}36}\approx$		$\frac{84{,}1}{37{,}2}\approx$	
12	$\frac{28}{15}\approx$		$\frac{37}{4{,}1}\approx$		$\frac{42}{87}\approx$		$\frac{66}{0{,}38}\approx$		$\frac{87{,}4}{27{,}3}\approx$	
13	$\frac{34}{14}\approx$		$\frac{55}{4{,}4}\approx$		$\frac{33}{93}\approx$		$\frac{35}{0{,}87}\approx$		$\frac{96{,}3}{34{,}2}\approx$	
14	$\frac{78}{17}\approx$		$\frac{76}{4{,}5}\approx$		$\frac{62}{94}\approx$		$\frac{63}{0{,}23}\approx$		$\frac{97{,}6}{13{,}8}\approx$	
15	$\frac{34}{24}\approx$		$\frac{57}{5{,}2}\approx$		$\frac{55}{63}\approx$		$\frac{34}{0{,}15}\approx$		$\frac{98{,}4}{23{,}4}\approx$	
16	$\frac{46}{26}\approx$		$\frac{89}{5{,}3}\approx$		$\frac{19}{67}\approx$		$\frac{32}{0{,}54}\approx$		$\frac{58{,}2}{12{,}4}\approx$	
17	$\frac{98}{48}\approx$		$\frac{37}{6{,}2}\approx$		$\frac{26}{86}\approx$		$\frac{41}{0{,}37}\approx$		$\frac{76{,}4}{23{,}6}\approx$	
18	$\frac{64}{37}\approx$		$\frac{82}{2{,}4}\approx$		$\frac{31}{64}\approx$		$\frac{23}{0{,}52}\approx$		$\frac{34{,}9}{12{,}4}\approx$	
19	$\frac{83}{16}\approx$		$\frac{73}{3{,}8}\approx$		$\frac{38}{84}\approx$		$\frac{64}{0{,}73}\approx$		$\frac{54{,}8}{11{,}3}\approx$	
20	$\frac{92}{26}\approx$		$\frac{89}{9{,}5}\approx$		$\frac{25}{63}\approx$		$\frac{46}{0{,}36}\approx$		$\frac{63{,}2}{13{,}6}\approx$	
21	$\frac{74}{36}\approx$		$\frac{57}{6{,}3}\approx$		$\frac{46}{84}\approx$		$\frac{45}{0{,}37}\approx$		$\frac{83{,}6}{27{,}7}\approx$	
22	$\frac{58}{26}\approx$		$\frac{87}{4{,}7}\approx$		$\frac{53}{74}\approx$		$\frac{37}{0{,}54}\approx$		$\frac{87{,}4}{43{,}2}\approx$	
23	$\frac{37}{25}\approx$		$\frac{69}{2{,}6}\approx$		$\frac{54}{93}\approx$		$\frac{62}{0{,}93}\approx$		$\frac{42{,}6}{21{,}6}\approx$	
24	$\frac{78}{32}\approx$		$\frac{53}{7{,}3}\approx$		$\frac{22}{67}\approx$		$\frac{36}{0{,}76}\approx$		$\frac{47{,}5}{15{,}3}\approx$	
25	$\frac{56}{23}\approx$		$\frac{74}{4{,}6}\approx$		$\frac{16}{54}\approx$		$\frac{32}{0{,}54}\approx$		$\frac{86{,}4}{13{,}2}\approx$	

TENGLAMA

Hayot tajriba va qiyinchiliklardan iborat :

Har gal qiyinchilik ko'rganingda saviyang ortadi.

Muvaffaqiyatsizlikka uchraganingda, quvvating yanada ortadi.

Tabassum qilganingda esa yanada ko'proq yaxshi umidlarga sho'ng'iysan.

IKKI NOMA'LUMLI TENGLAMA

Umumiy qonun

Barobardan so'ng ishora o'zgaradi.
Ya'ni (+) → (-) ; (-) → (+) bo'ladi ; (·) → (/) ; (/) → (·) bo'ladi

Masalan (1) :

$$32x + 46y = 18{,}8$$
$$x + y = 0{,}5$$

1) Birinchi bo'lib noma'lumlardan birini yo'qotamiz (x yoki y)

$$32x + 46y = 18{,}8$$
$$x + y = 0{,}5 \quad | \cdot 32$$
$$32x + 32y = 16$$

2) Masalan, x ni olib tashlash maqsadida ikkinchi qatorni 32 ga ko'paytiramiz va ikkinchi qator o'rniga yangi qator hosil qilamiz.

3) x · 32 = 32x

4) y · 32 = 32y

5) 0,5 · 32 = 16

6) Natijada quydagi qatorlar hosil bo'ldi

$$\cancel{32x} + 46y = 18{,}8$$
$$\cancel{32x} + 32y = 16$$
$$14y = 2{,}8$$

7) Katta qatordan kichik qatorni ayiramiz

8) 46y - 32y = 14y

9) 18,8 – 16 = 2,8

$$\frac{14y}{14} = \frac{2{,}8}{14}$$

10) Har ikkala tarafni *y* oldidagi songa bo'lamiz

$$y = 0{,}2$$

11) 14y / 14 = y

12) 2,8 / 14 = 0,2

13) Masalaning boshidagi quydagi holatga binoan,

$$x + y = 0{,}5$$
$$x + 0{,}2 = 0{,}5$$
$$x = 0{,}5 - 0{,}2$$
$$x = 0{,}3$$

14) y o'rniga 0,2 qo'yib olamiz

15) Barobardan so'ng ishora o'zgaradi degan qoidamizga binoan barobarning chap tomonidagi (+0,2) barobarning o'ng tomoniga (-0,2) ga o'tadi

$$x = 0{,}3$$
$$y = 0{,}2$$

16) Demak, quydagi xulosaga kelamiz

Video tushuntirish — **YouTube :** Kimyo uchun Matematika "Ikki nomalumli tenglama 1-misol"

IKKI NOMA'LUMLI TENGLAMA

Umumiy qonun

Barobardan so'ng ishora o'zgaradi.
Ya'ni (+) → (-) ; (-) → (+) bo'ladi ; (·) → (/) ; (/) → (·) bo'ladi

Masalan (2) :

$$32x + 60y = 78$$
$$8x + 9y = 16,5$$

1) Birinchi bo'lib noma'lumlardan birini yo'qotamiz (x yoki y)

$$32x + 60y = 78$$
$$8x + 9y = 16,5 \quad | \cdot 4$$

2) Masalan, x ni olib tashlash maqsadida ikkinchi qatorni **4** ga ko'paytiramiz va ikkinchi qator o'rniga yangi qator hosil qilamiz.

3) $8x \cdot 4 = 32x$

$$32x + 36y = 66$$

4) $9y \cdot 4 = 36y$

5) $16,5 \cdot 4 = 66$

6) Natijada quydagi qatorlar hosil bo'ldi

$$\cancel{32x} + 60y = 78$$
$$\cancel{32x} + 36y = 66$$

7) Katta qatordan kichik qatorni ayiramiz

$$24y = 12$$

8) $60y - 36y = 24y$

9) $78 – 66 = 12$

$$\frac{24y}{24} = \frac{12}{24}$$

10) Har ikkala tarafni *y* oldidagi songa bo'lamiz

$$y = 0,5$$

11) 14y / 14 = y

12) 12 / 28 = 0,5

13) Masalaning boshidagi quydagi holatga binoan,

$$8x + 9y = 16,5$$
$$8x + 4,5 = 16,5$$
$$8x = 16,5 - 4,5$$
$$8x = 12$$
$$x = 1,5$$

14) y o'rniga **0,5** qo'yib olamiz
9·**0,5**=4,5

15) Barobardan so'ng ishora o'zgaradi degan qoidamizga binoan, barobarning chap tomonidagi (+0,2) barobarning o'ng tomoni (-0,2) ga o'tadi

16) 12 / 8 = 1,5

$$x = 1,5$$
$$y = 0,5$$

17) Demak, quydagi xulosaga kelamiz :

Video tushuntirish

YouTube : Kimyo uchun Matematika "Ikki nomalumli tenglama 2-misol"

BIR NOMA'LUMLI TENGLAMA

Umumiy qonun

Barobardan so'ng ishora o'zgaradi,
Ya'ni (+) → (-) ; (-) → (+) bo'ladi ; (·) → (/) ; (/) → (·) bo'ladi.

Masalan :

$$\frac{64 + 16n}{160 + 18n} = 0{,}576$$

$$\frac{64 + 16n}{160 + 18n} = \frac{0{,}576}{1}$$

1) Har qanday butun son o'zi yozilgan paytida sur'atda turgan hisoblanadi, chunki har qanday sonni 1 ga bo'lsak, o'sha sonning o'zi bo'ladi

$$\frac{64 + 16n}{160 + 18n} = 0{,}576$$

2) Barobardan keyin ishora o'zgaradi, degan qoidamizga asoslanib, barobardan chap tomonda mahrajda turgan sonni, barobarning o'ng tomonidagi sur'atga ko'paytiruv ishorasi bilan o'tkazamiz.

3) $160 \cdot 0{,}576 = 92{,}16$

4) $18n \cdot 0{,}576 = 10{,}638$

$$64 + 16n = 92{,}16 + 10{,}368n$$

$$16n - 10{,}368n = 92{,}16 - 64$$

5) Ishoralar o'zgargan holda ma'lumlar bir tomonga, noma'lumlar esa boshqa bir tomonga o'tadi.

$$5{,}632n = 28{,}16$$

$$\frac{5{,}632n}{5{,}632} = \frac{28{,}16}{5{,}632}$$

6) Har ikkala tarafni n oldidagi songa bo'lamiz.

$$n = 5$$

7) Demak, quydagi xulosaga kelamiz.

Video tushuntirish

YouTube : Kimyo uchun Matematika “Bir nomalumli tenglama 1-misol”

BIR NOMA'LUMLI TENGLAMA (2)

Umumiy qonun

1) Birinchi bo'lib qavsning ichidan boshlaymiz.
2) Qavs ichidagi son qavs tashqarisiga alohida-alohida ko'paytiriladi.
3) Barobardan so'ng ishora o'zgaradi.
4) $(+) \cdot (-) = (-)$; $(-) \cdot (+) = (-)$
$(+) \cdot (+) = (+)$; $(-) \cdot (-) = (+)$

Masalan :

$$4(2x + 5) - 7(x + 1) = 3(x + 1)$$

1) Birinchi ishimizda qavs tashqarisidagi sonni qavs ichidagi songa alohida-alohida ko'paytirib chiqamiz.

$$4(2x + 5) - 7(x + 1) = 3(x + 1)$$

$(-) \cdot (+) = (-)$

$3 \cdot 1 = 3$

$4 \cdot 2x = 8x$

$$8x + 20 - 7x - 7 = 3x + 3$$

$3 \cdot x = 3x$

$4 \cdot 5 = 20$

$-7 \cdot x = -7x$

$-7 \cdot 1 = -7$

$$x + 13 = 3x + 3$$

2) Ikkinchi ishimiz noma'lum va ma'lumlarni alohida-alohida birlashtirib olish : $8x - 7x = x$; $8x - 7x = x$

$$13 - 3 = 3x - x$$

3) Barobardan so'ng ishorasi o'zgaradi $x \rightarrow -x$

$$10 = 2x$$

3) Barobardan so'ng ishorasi o'zgaradi $+3 \rightarrow -3$

$$\frac{10}{2} = \frac{2x}{2}$$

4) Har ikkala sonni x oldidagi songa bo'lamiz.

5) Demak $x = 5$ga teng ekan

$$5 = x$$

Video tushuntirish

YouTube : Kimyo uchun Matematika "Bir nomalumli tenglama 2-misol"

Tenglama 1-holat

No	1-holat					
1	44x + 30y = 20,8 x + y = 0.6	$x =$ $y =$	24x + 36y = 16,8 6x + 6y = 3,6	$x =$ $y =$	44x + 20y = 29,6 x + y = 1	$x =$ $y =$
2	40x + 30y = 35 x + y = 1	$x =$ $y =$	2x + 3y = 1,4 6x + 6y = 3,6	$x =$ $y =$	108x + 9y = 126 x + y = 3	$x =$ $y =$
3	64x + 32y = 54,4 x + y = 1	$x =$ $y =$	22,4x + 22,4y = 67,2 32x + 48y = 128	$x =$ $y =$	32x + 9y = 73 x + y = 0.6	$x =$ $y =$
4	16x + 30y = 18,2 x + y = 0,75	$x =$ $y =$	44x + 30y = 23,8 22x + 14y = 11,4	$x =$ $y =$	32x + 9y = 74,5 x + y = 3,5	$x =$ $y =$
5	48x + 16y = 44,8 x + y = 1,2	$x =$ $y =$	40x + 16y = 22 18x + 10y = 12	$x =$ $y =$	32,5x + 9y = 80,25 x + y = 5	$x =$ $y =$
6	65x + 64y = 193,5 x + y = 3	$x =$ $y =$	64x + 108y = 90,4 29x + 47y = 39.8	$x =$ $y =$	32x + 9y = 68 x + y = 5	$x =$ $y =$
7	16x + 30y = 18,8 x + y = 1	$x =$ $y =$	90x + 180y = 315 250x + 322y = 697	$x =$ $y =$	30x + 44y = 89 12x + 18y = 36	$x =$ $y =$
8	80x + 64y = 70,4 x + y = 1	$x =$ $y =$	126x + 90y = 73,8 246x + 250y = 173,8	$x =$ $y =$	16x + 30y = 131 10x + 18y = 80	$x =$ $y =$
9	56x + 64y = 61,2 x + y = 1	$x =$ $y =$	286x + 322y = 20,8 106x + 142y = 97,5	$x =$ $y =$	4x + 2y = 2,9 22400x + 22400y = 22400	$x =$ $y =$
10	14x + 44y = 18,5 x + y = 1	$x =$ $y =$	30x + 100y = 59 20x + 50 = 31	$x =$ $y =$	20x + 40y = 35 22,4x + 22,4y = 28	$x =$ $y =$
11	16x + 30y = 23,7 x + y = 1	$x =$ $y =$	36x + 24y = 114 8x + 6y = 27	$x =$ $y =$	48x + 64y = 53,6 22,4x + 22,4y = 22,4	$x =$ $y =$
12	24x + 32y = 27,2 x + y = 1	$x =$ $y =$	x + y = 0,04 32x + 108y = 2,04	$x =$ $y =$	30x + 20y = 28 22,4x + 22,4y = 22,4	$x =$ $y =$
13	16x + 28y = 38 x + y = 2	$x =$ $y =$	x + y = 0,06 32x + 56y = 2,4	$x =$ $y =$	14x + 36y = 50 22,4x + 22,4y = 44,8	$x =$ $y =$
14	48x + 20y = 44 x + y = 1,5	$x =$ $y =$	x + y = 0,1 80x + 104y = 9,44	$x =$ $y =$	18x + 24y = 66 4x + 7y = 18	$x =$ $y =$
15	38x + 64y = 153 x + y = 3	$x =$ $y =$	x + y = 0,08 80x + 104y = 7,36	$x =$ $y =$	20x + 40y = 34 5x + 5y = 5	$x =$ $y =$

Tenglama 2-holat

No	2-holat			
1	$\frac{64+16n}{160+18n}= 0{,}576$	$n=$	$\frac{72-106x}{400+219x-100x}= 0{,}12$	$x=$
2	$\frac{64+16n}{120+18n}= 0{,}715$	$n=$	$\frac{76{,}5-106x}{500+219x-100x}= 0{,}1$	$x=$
3	$\frac{64+16n}{136+18n}= 0{,}558$	$n=$	$\frac{109-106x}{500+219x-100x}= 0{,}1$	$x=$
4	$\frac{64+16n}{136+18n}= 0{,}497$	$n=$	$\frac{125{,}2-208x}{400+322x-233x}= 0{,}2$	$x=$
5	$\frac{48+16n}{106+18n}= 0{,}7272$	$n=$	$\frac{256-208x}{600+322x-233x}= 0{,}15$	$x=$
6	$\frac{64+16n}{142+18n}= 0{,}696$	$n=$	$\frac{244-208x}{700+322x-233x}= 0{,}25$	$x=$
7	$\frac{192+16n}{342+18n}= 0{,}72$	$n=$	$\frac{117{,}6+98x}{300+80x}= 0{,}6$	$x=$
8	$\frac{192+16n}{400+18n}= 0{,}607$	$n=$	$\frac{264{,}6+98x}{900+80x}= 0{,}655$	$x=$
9	$\frac{192+16n}{392+18n}= 0{,}576$	$n=$	$\frac{117{,}6+98x}{300+80x}= 0{,}7$	$x=$
10	$\frac{2n+2}{14n+18}= 0{,}13$	$n=$	$\frac{147x}{400+138x}= 0{,}5$	$x=$
11	$\frac{16}{14n+18}= 0{,}267$	$n=$	$\frac{178x}{500+196x}= 0{,}289$	$x=$
12	$\frac{12n}{14n+18}= 0{,}649$	$n=$	$\frac{150-36x}{200-160x+2x}= 0{,}91$	$x=$
13	$\frac{32}{14n+32}= 0{,}533$	$n=$	$\frac{1+(x+3)0{,}25}{x+3+(x+3)0{,}25}= 0{,}314$	$x=$
14	$\frac{2n}{14n+32}= 0{,}081$	$n=$	$\frac{1+(x+5)0{,}5}{x+5+(x+5)0{,}5}= 0{,}4$	$x=$
15	$\frac{16}{14n+16}= 0{,}276$	$n=$	$\frac{1+(x+5)0{,}2}{x+5+(x+5)0{,}2}= 0{,}22$	$x=$
16	$\frac{2n+3}{14n+17}= 0{,}161$	$n=$	$\frac{80+160x}{200+250x}= 0{,}49$	$x=$
17	$\frac{2n+3}{14n+17}= 0{,}1556$	$n=$	$\frac{60+120x}{240+246x}= 0{,}37$	$x=$

Tenglama 1-2 -bosqich

No	1-bosqich		2-bosqich	
1	$4x = 0{,}24$	$x =$	$0{,}3x - 0{,}8x + 5 = x - 4$	$x =$
2	$-9x = 243$	$x =$	$4(x-1) = 2x - 3$	$x =$
3	$7x = 7$	$x =$	$3(x+2) = 4 + 2x$	$x =$
4	$25x - 1 = 9$	$x =$	$7(x+1) - 6x = 10$	$x =$
5	$6x + 8 = 12$	$x =$	$5(x+1) - 4x = 4$	$x =$
6	$3x - 5 = 10 - x$	$x =$	$0{,}71x + 1{,}98 = 0{,}37x - 1{,}76$	$x =$
7	$4x + 4 = x + 5$	$x =$	$0{,}18y - 7{,}4 = 0{,}05y - 5{,}71$	$y =$
8	$0{,}3x = 6$	$x =$	$5(5x-1) - 2{,}7x + 0{,}2x = 6{,}5 - 0{,}5x$	$x =$
9	$8x - (7x + 8) = 9$	$x =$	$0{,}36x - 0{,}6 = 0{,}3(0{,}4x - 1{,}2)$	$x =$
10	$11x = 55$	$x =$	$3(x-1) - 2(x+2) = 4x + 8$	$x =$
11	$2x - 3 = x + 1$	$x =$	$4(x + 1{,}5) + 3(1 - x) = 10$	$x =$
12	$45 - 2x = 3x + 5$	$x =$	$4(3x+2) - 7(x+1) = 3(x-1)$	$x =$
13	$9x - 32 = 2 + 5x$	$x =$	$2{,}5(2x+3) - 2(x + 2{,}5) = 3{,}5 + 2x$	$x =$
14	$4x - 7 = 2x - 3$	$x =$	$5(x-1) + 7 = 3(x+1) + 1$	$x =$
15	$8x - 3 = x + 11$	$x =$	$2(x+1) + 3 = 3(x-1) + 6$	$x =$
16	$4x + 3 = x - 9$	$x =$	$3(3x+5) - 4(3x-5) = 0$	$x =$
17	$2x - 19 = 8 - x$	$x =$	$7(5-x) + 2 = 5(6-x) + 1$	$x =$
18	$7x + 3 = 3x + 27$	$x =$	$4(x-3) - 3(x+2) = -19$	$x =$
19	$3x - 7 = 2x + 3$	$x =$	$2x + 1 + 3(x-2) = 14$	$x =$
20	$42 - x = 2x + 9$	$x =$	$-5(7-x) - 4(x-8) = 3$	$x =$
21	$20 + 3x = 4 - x$	$x =$	$2(x-4) - 5(x-6) = 1$	$x =$
22	$2x - 19 = 8 - x$	$x =$	$-9 \cdot (2x-7) + 17 \cdot (x-1) = 0$	$x =$
23	$11 - 6x = 31 - 10x$	$x =$	$-7 \cdot (2x-3) + 5 \cdot (3x-2) = 0$	$x =$
24	$x + 2 = -x + 14$	$x =$	$5(x+4) = 9x + 12$	$x =$
25	$4 + 8y + 8 = 2y - 10 - 7y + 9$	$y =$	$8 - 5(4 - 3x) = 18$	$x =$
26	$2{,}5x - 8 = 12 - 2{,}5x$	$x =$	$-8 \cdot (3x-2) + 5 \cdot (5x-3) = 0$	$x =$
27	$16{,}4x - 4{,}8 = 6{,}4x + 5{,}2$	$x =$	$5x + 6 - (3x-4) = x - 3 - (2x-4)$	$x =$
28	$27x + 44 = 53 - 3x$	$x =$	$21 - 9x = 24 - 12x$	$x =$
29	$32x = 16$	$x =$	$3(4-x) + 1 = 2(3-x) + 6$	$x =$
30	$5x + 3(3x+7) = 35$	$x =$	$3{,}7x - 1{,}8 = 5{,}2 - 3{,}3x$	$x =$

Javoblar

Qo'shuv 1-12 - bosqich javoblari												
	1-b	2-b	3-b	4-b	5-b	6-b	7-b	8-b	9-b	10-b	11-b	12-b
1	18	43	60	71	102	228	324	460	654	750	1054	1134
2	14	40	35	76	126	227	429	389	678	737	854	1299
3	17	45	63	87	146	221	351	544	611	768	705	1272
4	22	34	64	80	89	216	358	609	513	770	947	1163
5	20	57	53	68	116	209	384	504	754	854	1144	992
6	11	38	62	69	119	224	270	391	420	709	981	1265
7	20	39	51	103	111	193	376	439	859	788	1215	1103
8	18	29	50	63	83	206	347	495	691	910	948	1189
9	19	28	59	51	81	210	332	451	597	745	919	1359
10	27	34	66	83	89	258	341	380	569	677	917	1044
11	19	40	52	68	57	280	318	417	581	965	874	851
12	18	28	56	86	73	172	316	565	494	739	1011	1100
13	20	48	70	82	130	192	265	367	527	594	1038	1183
14	23	28	64	72	94	239	407	519	792	837	805	937
15	17	45	54	66	69	259	392	535	566	854	919	1073

Qo'shuv 13-22 - bosqich javoblari										
	13-b	14-b	15-b	16-b	17-b	18-b	19-b	20-b	21-b	22-b
1	1205	1212	1238	1838	1877	2449	2354	1885	2820	2307
2	1386	1309	1743	1921	1730	1732	2262	2166	3073	2376
3	1511	1411	1686	2092	2128	2215	2563	1675	2385	2569
4	1239	1829	1295	1747	1927	1795	2321	2461	2228	2905
5	985	1777	1262	1275	2077	2164	2149	2629	2345	3171
6	1184	1460	1508	1690	1905	1944	2076	2202	2664	3150
7	1382	1375	1370	1533	1500	1528	2735	2431	2481	2290
8	1264	1358	1260	1431	2027	1993	2068	2507	2142	2643
9	1516	1233	1363	1548	1359	2437	1864	2455	2844	3268
10	1224	1488	1801	1899	1912	2133	1968	2040	2303	2511
11	1242	1566	1630	1603	1655	2025	2153	1841	2525	3101
12	945	1373	1745	1915	2115	2297	2235	1876	2454	2828
13	812	1606	1620	1455	1841	2108	2387	2200	2353	2806
14	1207	1679	1236	1316	1546	1908	1929	2512	2505	2512
15	1523	1356	1427	1725	1792	1707	1971	2267	2322	1997

Qo'shuv 23-32 - bosqich javoblari										
	23-b	24-b	25-b	26-b	27-b	28-b	29-b	30-b	31-b	32-b
1	1798	2010	1633	3377	3284	4372	4153	3875	2998	4130
2	1978	2379	3295	3487	3983	3784	4212	4505	4274	4322
3	2360	3434	3300	4117	3286	4244	3510	4319	3802	3821
4	2642	1823	2521	4034	3515	2797	3464	4197	3892	4631
5	2240	2724	2967	2477	2858	3393	3869	3384	4263	4366
6	2606	3257	3583	2750	3490	3406	3967	3780	3934	4761
7	2822	3332	2396	3959	3648	3157	3801	4480	3086	3769
8	2432	2635	3256	2948	2458	3771	3943	5004	3431	4371
9	2247	2634	3634	3490	4037	3029	4390	4336	3493	3745
10	3059	3149	3533	2770	3399	3277	3990	2635	4611	5245
11	2078	3006	2737	3456	3383	4368	3455	3552	2829	4736
12	2753	3046	3255	3032	2825	3511	4280	4925	3410	4151
13	1799	3267	3040	2474	3174	3486	4308	3921	3763	3478
14	2675	2255	3108	2904	3558	2712	3631	4009	3610	4528
15	2901	3216	3404	3118	3378	3405	4499	3898	3832	3910

Qo'shuv 33-42 - bosqich javoblari										
	33-b	34-b	35-b	36-b	37-b	38-b	39-b	40-b	41-b	42-b
1	3969	5510	4326	3684	4763	6017	6170	5551	5030	4641
2	4529	4319	4371	4662	3656	4654	3780	5690	6115	6560
3	3831	4616	4324	4659	5747	5742	5940	4490	4671	4971
4	4709	4456	4907	5432	5131	4660	4121	4975	5580	4914
5	4291	4004	4327	5455	4448	5516	6462	5005	6310	5659
6	4544	4945	5542	5341	4428	4726	4998	4373	5149	4844
7	4431	4193	5126	3978	4235	5618	4560	5038	5272	5265
8	4133	4932	4765	5180	3774	4640	5320	5218	5412	6212
9	3786	4708	4704	5041	4014	5039	5320	4456	5409	4759
10	4761	4931	5779	4087	4736	5283	4569	5642	6864	7142
11	4628	4777	5169	4785	5270	5189	5686	4550	5728	6212
12	4428	3305	4338	5068	4494	5167	4465	4584	4708	6699
13	3954	4982	5469	5320	5503	6204	6827	6427	5394	6910
14	4744	5005	5923	5474	4908	6308	6347	4980	6663	4409
15	3109	5067	5322	7836	4739	4934	4146	5100	5764	5028

Qo'shuv 43-52 - bosqich javoblari										
	43-b	44-b	45-b	46-b	47-b	48-b	49-b	50-b	51-b	52-b
1	5899	6087	6117	6523	6050	6303	8222	6962	5900	6327
2	5517	4998	5181	6287	6210	6643	6595	6606	6350	5211
3	6857	5342	7905	6348	6891	7364	6041	8202	7590	8317
4	4456	6173	5601	6782	6345	4796	5351	7343	6743	8186
5	6116	4794	7340	5766	4710	5079	7983	6422	5591	7451
6	5961	5767	4593	5050	5971	6469	6183	5782	5765	7798
7	7375	7463	5179	7155	6355	6711	6846	5692	6379	6919
8	7207	4949	4570	7240	5606	6853	5902	6120	4787	5164
9	6438	4828	5356	5600	4874	7709	5449	6475	7719	7955
10	3983	5763	5684	6532	6260	5320	6750	6821	5858	7202
11	6462	6666	7347	5727	6721	6978	5701	4767	7242	7745
12	6330	6015	5640	7433	5267	5627	6236	5769	6844	5847
13	6959	4860	4494	6413	4909	8191	5553	5809	8455	4890
14	5976	5149	5071	5455	7005	7979	4829	7546	7249	5245
15	5498	6210	5927	6290	4397	6228	6085	8149	7398	7799

Qo'shuv 53-62 - bosqich javoblari										
	53-b	54-b	55-b	56-b	57-b	58-b	59-b	60-b	61-b	62-b
1	9467	7297	6488	8019	8304	8363	7774	8344	8510	8871
2	6406	8044	7798	7396	6306	8474	7867	9636	8840	8658
3	5664	7845	8249	7150	8576	7392	8024	8403	8394	9891
4	8098	7380	7560	8455	8546	8138	7768	9306	7498	9042
5	6671	7699	8390	7454	9788	8016	7795	6364	7889	9752
6	6299	5851	7874	6153	8666	7578	6822	6446	6855	9906
7	7333	6764	6514	7343	9047	7286	9873	7806	7922	9259
8	6859	6663	8101	6755	8881	8331	8579	8441	8865	8250
9	6925	8356	8094	7849	6249	7701	7447	8113	8553	9872
10	7446	7080	7444	6142	8071	7493	8510	6872	8589	9225
11	6683	8745	7966	8080	7384	8787	8960	8205	6629	9898
12	8625	6867	5610	9947	9292	7625	7631	7027	8594	8806
13	6157	6421	5343	5578	6667	8363	7544	8814	7701	7127
14	6366	6719	7445	8243	8048	5716	6199	9093	8659	9541
15	8717	6960	4377	8504	5727	7546	9099	8384	8467	9128

Qo'shuv 63-72 - bosqich javoblari										
	63-b	64-b	65-b	66-b	67-b	68-b	69-b	70-b	71-b	72-b
1	8870	9779	11826	10046	9286	9555	12082	6823	10031	9040
2	10070	9816	9523	7111	8326	9384	9009	11861	12246	12001
3	8162	7616	10392	8451	10019	9452	8030	9750	9105	8717
4	8696	9048	9036	11048	6831	10014	10899	8062	8560	12600
5	9423	10413	9033	6544	7070	9810	10843	11570	9967	10408
6	8043	7544	7302	8339	9455	7099	8314	7898	10847	9343
7	8741	9247	10860	9058	8202	8475	9273	11337	11445	10798
8	10533	9353	7059	11174	8062	11351	7763	7840	11036	13053
9	9524	8239	7720	9538	10194	8408	9752	12477	11714	10799
10	8924	7977	6525	9093	9694	8352	7855	8637	8583	9990
11	6773	8860	10770	8657	9696	9518	11559	10864	9448	8988
12	8163	9642	9405	9375	9085	8319	12530	11153	7660	8501
13	10407	8325	11045	8518	11095	8280	9147	8845	8605	9099
14	6853	9051	10326	10175	9677	10702	9897	10022	10327	11464
15	10297	9282	8642	9686	9221	10456	9086	10124	9816	11214

Qo'shuv 73-82 - bosqich javoblari										
	73-b	74-b	75-b	56-b	77-b	78-b	79-b	80-b	81-b	82-b
1	10630	10604	8888	11513	9553	9130	11484	10696	12902	12126
2	8692	12062	10649	7337	10259	13309	11738	14691	9668	14401
3	9061	9087	12875	8343	9963	11118	9158	11861	13029	9267
4	8502	9005	9457	12572	10177	10104	10398	9357	12978	11732
5	11881	11761	8819	12663	10639	9878	11834	13217	12625	11691
6	8278	11801	8157	10958	9154	7585	12284	10478	9895	10022
7	10054	9197	9360	9911	10040	11816	9369	14413	14555	11115
8	11014	8318	9926	7349	11331	7881	11973	10850	11230	10785
9	9537	7793	10627	8650	10565	11676	12793	11513	13080	12240
10	10821	11550	10226	13275	13145	13184	10920	10830	11768	9986
11	9159	8968	13604	13475	10683	12525	9873	10421	11329	14642
12	9666	10042	12021	9464	13812	11599	9292	11389	12066	10229
13	10352	13350	11444	10589	11632	10476	13555	11749	8262	12241
14	11875	11907	8584	11339	11619	11869	11014	13150	11557	14143
15	9225	10939	10125	8987	10721	12697	9553	11450	9069	11748

Qo'shuv 83-92 - bosqich javoblari										
	83-b	84-b	85-b	86-b	87-b	88-b	89-b	90-b	91-b	92-b
1	11327	13477	13528	14372	14936	12833	12582	13400	10236	11232
2	8827	12522	14515	11023	9916	11753	13112	11513	12338	17086
3	11329	14396	10569	10435	13491	12076	15608	14486	15222	12968
4	11618	12830	13588	15088	12781	12405	9803	9360	11475	12668
5	11358	12179	12828	15080	11524	13736	11707	11516	12272	13707
6	10097	11315	11440	13072	11364	14749	11112	9710	14153	13216
7	8738	13575	11454	10522	12055	13751	13140	13749	13013	13752
8	13901	12278	10455	12070	12454	15263	12550	10526	10294	11523
9	13841	12590	10139	13375	12486	11465	14713	12833	9437	13635
10	10960	13493	11548	14524	11481	14684	14314	14451	9285	12411
11	12839	11419	13087	9020	9687	12502	12573	14312	14259	12275
12	11865	10615	12768	15129	12940	12542	11939	11454	12716	12527
13	9310	10197	12365	14015	13661	12846	9606	13737	12441	14293
14	11868	10837	13747	9534	12127	12146	12314	15639	12691	13353
15	12224	8738	11098	9051	11284	12552	14780	13323	12851	11450

Qo'shuv 93-100 - bosqich javoblari										
	93-b	94-b	95-b	96-b	97-b	98-b	99-b	10-b		
1	11069	12907	10870	13497	15828	11535	12411	12441	13395	16877
2	13701	14637	13472	12107	14438	11443	11068	15383	14249	15366
3	13235	11913	16873	13632	14678	14112	13680	16131	14966	15837
4	12321	15391	13167	13723	15474	14237	16214	11307	16886	16497
5	10107	13441	13071	14098	14940	16919	14515	10832	17101	12088
6	10510	14299	14379	13559	13372	11267	11739	16872	14931	15187
7	15897	9546	12631	15544	12763	12304	14510	13541	12861	16747
8	9806	10947	15753	16918	17017	17887	18015	15674	11462	12684
9	11019	12128	12340	16006	15642	15297	13503	12866	13578	14248
10	16541	16307	14433	11986	14097	17157	13367	15239	10210	13894
11	14126	14385	9834	14751	11520	17795	10773	10716	13520	16755
12	11643	14948	11934	14643	12507	14982	17198	16267	14873	11729
13	11009	9717	12160	12668	11544	16409	14550	16935	10875	13842
14	12995	11203	14899	15517	10894	15923	15242	10458	14682	15063
15	14281	11632	13868	17675	14056	12428	14144	12281	15972	12691

Ayiruv 1-20 - bosqich javoblari												
	1-b	2-b	3-b	4-b	5-b	6-b	7-b	8-b	9-b	10-b	11-b	12-b
1	7	4	3	45	50	35	105	213	87	71	275	57
2	11	9	25	47	57	74	54	118	216	254	203	367
3	12	32	42	40	48	100	44	26	260	183	397	269
4	4	27	34	27	31	52	88	76	206	94	110	390
5	5	18	35	53	21	90	143	20	196	247	361	72
6	17	4	26	43	3	22	128	45	106	102	268	425
7	6	24	37	20	4	19	122	181	145	117	366	407
8	0	15	31	39	7	77	49	58	152	191	214	408
9	16	24	20	58	29	26	83	167	185	352	316	499
10	8	23	9	23	13	51	38	152	97	125	211	384
11	1	9	23	8	40	71	96	42	120	215	208	149
12	9	4	19	20	58	40	170	56	44	134	74	183
13	16	25	24	1	35	65	127	204	153	299	48	201
14	15	27	40	60	53	12	132	105	120	285	403	47
15	5	1	35	32	28	84	30	26	57	294	42	346

Ayiruv 13-22 - bosqich javoblari										
	13-b	14-b	15-b	16-b	17-b	18-b	19-b	20-b	21-b	22-b
1	84	192	570	337	122	593	398	653	683	816
2	203	550	281	333	903	349	456	610	309	310
3	280	443	502	609	602	83	899	814	831	349
4	291	377	305	368	605	360	759	866	889	201
5	375	512	561	711	516	250	385	493	671	375
6	511	373	26	293	710	105	131	425	1062	796
7	432	364	308	372	252	351	366	652	480	820
8	430	413	529	308	240	384	917	935	431	984
9	230	507	314	772	238	483	296	630	893	542
10	385	431	328	392	351	444	524	846	735	1171
11	456	508	280	680	250	506	660	908	644	206
12	308	421	319	349	741	245	797	970	442	195
13	451	533	410	585	166	467	691	1040	468	1137
14	166	166	180	690	283	472	1027	555	593	596
15	267	345	434	295	300	162	570	887	799	668

Ayiruv 23-32 - bosqich javoblari										
	23-b	24-b	25-b	26-b	27-b	28-b	29-b	30-b	31-b	32-b
1	550	641	667	239	1039	735	717	1139	515	1288
2	708	854	516	170	917	849	1334	240	1948	852
3	642	1189	678	1110	1036	1569	1004	940	473	552
4	616	619	573	1170	88	691	178	1697	1494	398
5	523	1011	561	62	757	1405	809	1022	1582	1832
6	538	698	990	491	470	970	216	841	1631	328
7	871	943	376	1008	244	1029	1405	542	1330	393
8	346	381	503	89	585	428	1424	1452	1448	1230
9	739	642	309	465	673	91	636	595	673	447
10	355	818	976	1045	1095	916	464	1069	1230	2003
11	1109	675	568	967	857	233	182	863	1519	1041
12	424	767	843	792	1031	325	1049	1384	869	1360
13	540	773	618	1023	941	720	221	1334	143	1727
14	481	751	430	566	421	259	169	851	1310	1704
15	474	688	1066	670	839	1302	1154	501	1432	256

Ayiruv 33-42 - bosqich javoblari										
	33-b	34-b	35-b	36-b	37-b	38-b	39-b	40-b	41-b	42-b
1	523	1333	355	615	1546	1640	849	2297	1560	745
2	781	1591	1109	1060	2034	2219	2399	705	138	678
3	854	193	1536	1421	581	813	814	611	1658	583
4	1366	1516	1417	730	1234	403	1226	2225	1157	327
5	1064	1557	1327	1804	2045	1615	1119	1242	1607	1442
6	1140	783	1718	1272	241	2102	2002	1465	1251	1443
7	721	1127	815	1091	791	992	1352	190	297	1403
8	504	503	475	1221	1504	1677	478	1840	1372	2059
9	1070	133	1636	445	1861	2156	1975	2308	567	1457
10	805	1626	1490	596	1383	1346	698	549	1258	1479
11	693	1076	1463	494	1408	374	573	1634	302	310
12	210	1534	1490	1558	1598	1054	2053	1718	449	1648
13	1641	782	1979	1170	148	1359	1376	1569	1921	1536
14	1133	564	896	296	162	1752	2095	182	1403	1940
15	2020	184	1404	1975	1364	1133	1154	718	1588	1801

Ayiruv 43-52 - bosqich javoblari										
	43-b	44-b	45-b	46-b	47-b	48-b	49-b	50-b	51-b	52-b
1	1442	560	494	854	1090	1585	1969	1639	3020	290
2	1635	2027	954	2341	1745	1234	999	2437	1580	2786
3	1271	1390	648	1856	2778	2197	206	1933	2128	2731
4	1022	1726	1615	2612	2802	981	1075	1660	2470	1036
5	2284	1790	1840	1683	745	1317	2297	895	2636	1049
6	756	424	878	1551	1976	914	2457	2815	2379	2026
7	2508	456	269	1201	1161	1595	646	2325	709	562
8	1211	1476	1007	1851	684	1995	2170	2371	2420	3026
9	664	1718	1389	2087	328	1289	2431	526	2601	1435
10	1037	2429	1868	1737	582	1342	2172	1776	263	346
11	841	2476	707	2472	2305	1415	1671	2921	469	2563
12	2134	2465	1826	1073	2876	2022	1245	865	2354	2067
13	899	1266	2035	2425	1591	2147	1480	909	2757	2621
14	951	2430	651	789	1139	1678	833	438	1046	2361
15	73	1886	853	3024	2511	680	2166	3281	2387	719

Ayiruv 53-62 - bosqich javoblari										
	53-b	54-b	55-b	56-b	57-b	58-b	59-b	60-b	61-b	62-b
1	1098	531	699	1580	2897	2774	3397	2969	1289	2215
2	1056	2995	601	3022	2622	2372	2691	2163	811	2851
3	2158	1071	3385	1984	2248	1195	2386	1390	150	1212
4	1899	1095	2331	2995	799	3188	2356	505	2354	1667
5	1265	825	3655	726	1790	1549	2589	3313	655	2339
6	228	783	1598	2762	3037	564	2305	3254	1719	3393
7	1390	674	1545	2320	915	1800	3402	2223	1365	1187
8	2780	2103	428	1770	2842	2230	1638	1683	3578	2595
9	1909	2286	680	2472	2408	1719	1231	3708	1444	2749
10	2900	1128	830	2793	2785	1146	987	3253	1176	3681
11	809	1831	2106	1324	3331	2038	3199	3544	4087	3721
12	2117	2254	858	2821	342	2917	2866	2018	1421	1008
13	2048	1802	2955	1566	1114	1114	2925	3157	853	1866
14	2248	1812	749	2252	3690	44	2480	2967	2142	2878
15	1856	2849	3037	3123	1779	1938	2903	994	2781	1466

Ayiruv 63-72 - bosqich javoblari										
	63-b	64-b	65-b	66-b	67-b	68-b	69-b	70-b	71-b	72-b
1	1685	2112	3350	3291	3422	426	4092	3311	4047	2450
2	1267	2066	2252	2161	1479	4360	2949	3349	878	885
3	1041	2755	3113	2145	1027	2501	1124	2614	2300	2913
4	1172	3012	2417	573	2712	2682	3573	1563	1644	1601
5	2114	1423	1962	2925	1732	926	1931	2303	949	446
6	2847	2177	4070	1893	1572	3884	2315	3327	1611	3339
7	1227	2827	307	3103	3084	3740	2246	1721	2228	2423
8	2542	1208	3844	773	4134	1414	2234	1636	1719	1888
9	1121	3085	3356	2381	2856	1774	2010	3260	2181	3575
10	2023	2858	2500	3064	1300	2683	892	2430	4077	2978
11	2994	1391	3112	2443	3476	2552	3603	4057	2775	2669
12	1309	3692	3125	1000	683	3014	2551	260	1450	737
13	3817	1785	641	2354	2833	3219	1616	3160	3331	1830
14	1652	2263	3050	2772	3742	988	2391	3554	3365	3455
15	1882	3092	4052	1709	3855	2569	1100	2559	4234	2697

Ayiruv 73-82 - bosqich javoblari										
	73-b	74-b	75-b	56-b	77-b	78-b	79-b	80-b	81-b	82-b
1	1891	1899	3652	2337	2091	2416	2910	4140	4110	2195
2	4280	3459	1173	2351	4518	1216	3737	2053	3808	2786
3	1768	3613	1852	2288	2695	3106	3267	2929	2566	1554
4	1506	2147	2549	2070	1957	3504	4521	2493	3714	4114
5	3857	3653	1605	1238	1685	2155	4623	2262	1791	2093
6	2063	1464	1911	4635	3832	2885	1247	4128	1768	5111
7	1937	2222	2020	4488	2998	4701	3939	73	3354	1158
8	2071	4439	3278	4320	4919	865	2803	1534	2392	3850
9	4090	2504	2958	2774	4319	3500	1255	3333	2403	908
10	1243	2545	1995	3609	1228	3094	2036	1882	5134	2872
11	1865	1827	2571	2840	4263	2526	3290	3712	2625	4747
12	1782	3675	2654	3726	3417	3631	4279	3139	3317	4101
13	3268	3201	1062	2063	4296	2414	3781	4331	1829	3875
14	3200	2091	1927	3879	4094	906	3536	2494	1604	1489
15	3541	576	1341	3109	4076	2614	4338	3283	3623	2650

Ayiruv 83-92 - bosqich javoblari										
	83-b	84-b	85-b	86-b	87-b	88-b	89-b	90-b	91-b	92-b
1	2028	3012	3425	4393	1004	5115	2830	3811	1775	3135
2	2394	2352	4643	1671	3612	2626	1843	4461	2851	4632
3	2644	5242	345	1338	1743	3457	3084	2819	3189	1671
4	3162	2372	4049	5679	2490	5525	4517	3494	4208	1406
5	1674	3822	1837	3901	3020	2772	2185	4515	2070	3952
6	5295	2869	5432	4426	1873	2153	3683	5682	2578	1453
7	5762	4818	4726	4825	4253	1556	4290	5035	4215	4104
8	1704	2165	2099	2911	4218	2527	2915	848	2519	6296
9	1747	3026	2993	3681	4036	3144	1958	2459	4128	2724
10	1371	2116	3403	1607	3648	3605	3214	5090	2788	1233
11	876	1893	4296	1304	2941	985	2965	3939	1072	1478
12	1260	3089	1074	2800	3363	1595	3556	1331	559	2764
13	2464	2481	3056	2539	4282	2556	3383	1103	3231	3965
14	3075	1810	3454	5560	4507	3570	1438	6252	5275	3661
15	809	3095	1586	1481	2181	1558	1562	3354	79	5916

Ayiruv 93-100 - bosqich javoblari										
	93-b	94-b	95-b	96-b	97-b	98-b	99-b	10-b		
1	897	4314	1450	3124	3963	2029	5392	2024	5434	4979
2	4606	2801	5062	3260	4971	3616	6753	1114	4125	5367
3	3973	2131	3930	4628	4286	3281	2926	1959	6163	2768
4	2200	5810	646	1990	3850	1866	1546	2441	3807	751
5	3557	4153	3473	2049	3574	3453	4839	6813	4469	3499
6	2671	3745	3199	4479	1545	2114	4325	1572	1234	2469
7	5443	2359	2560	3149	1109	4602	4420	2763	863	2145
8	1186	3372	3419	4448	1504	1509	1170	1734	840	1031
9	4347	3591	5293	1183	868	1868	1590	3477	3639	5368
10	1443	6309	6062	4612	3794	670	2726	4321	4676	4740
11	3285	3420	5466	5668	4996	3209	3937	338	4213	2807
12	1844	3346	1857	5341	5463	2236	3052	322	4845	4031
13	2307	3559	4782	1439	4329	3050	1202	3701	1915	5128
14	2057	4886	5896	5332	1360	4896	5586	3855	5206	4974
15	1248	5681	4673	2030	3810	3800	4082	2309	2655	3827

Proporsiya 1-4 - bosqich javoblari									
	1-b	2-b	3-b	4-b		1-b	2-b	3-b	4-b
1	10	12	0,2	0,2	10	21	6,6	42	3,5
2	35	112	1,25	14,4	11	30	90	640	1
3	117	8	1,25	10	12	15	40	13,44	86,6
4	20	66	0,2	0,1	13	20	15	6	20,25
5	72	8	24	7	14	55	60	390	4
6	2	63	33,625	196	15	10,8	18	80	1700
7	35	6	5,5	31,5	16	24	10	10	2
8	15	99	75	165	17	104	88	88	4,5
9	2	4,2	0,05	0,224	18	175	504	504	3,25

Avogadro 1-12 - bosqich javoblari												
	1-b	2-b	3-b	4-b	5-b	6-b	7-b	8-b	9-b		10-b	
1	2	2,5	0,2	0,25	52	5,6	0,51	0,58	22	0,11	12	0,56
2	4	3,5	0,3	3,5	63	6,6	0,62	6,2	3,3	23	2,3	35
3	5	4,6	0,45	45	74	7,6	0,73	88	0,25	0,5	0,45	4,1
4	6	2,1	0,25	15	85	8,7	0,84	0,69	99	40	12	32
5	25	3,1	0,14	0,12	96	9,5	0,95	8,9	5,1	2,1	6,5	45
6	14	4,8	0,36	0,45	54	5,1	0,55	95	0,9	31	78	88
7	45	3,2	0,12	31	65	6,7	0,65	0,55	20	0,52	0,12	9,8
8	32	1,4	0,28	14	77	8,4	0,75	9,4	1,1	6,8	13	48
9	21	1,9	0,39	0,7	87	9,3	0,85	78	11	7,4	5,6	45
10	13	3,9	0,41	13	996	5,2	0,97	0,75	0,24	0,72	33	0,1
11	35	2,7	0,18	24	58	6,6	0,57	6,7	32	16	0,77	11
12	44	1,6	0,26	2,3	64	7,9	0,68	9,6	2,5	2,5	89	1,2
13	26	4,2	0,31	0,47	71	8,8	0,79	77	55	34	9,3	13
14	42	1,1	0,22	0,22	82	9,1	0,81	0,81	0,61	0,51	23	0,75
15	37	1,3	0,41	0,31	93	5,5	0,96	0,62	78	32	0,41	15
16	19	2,4	0,12	49	59	6,5	0,58	7,5	9,6	9,2	74	1,6
17	28	3,6	0,24	3,4	66	7,5	0,63	6,8	32	41	70	64

Hajimdan mol 1-10 - bosqich javoblari										
	1-b	2-b	3-b	4-b	5-b	6-b	7-b	8-b	9-b	10-b
1	0,1	0,15	2,5	0,45	0,02	2,6	45	0,445	0,3	2,5
2	2	0,25	0,1	0,85	0,01	1,6	26	0,225	0,4	6,5
3	0,3	0,75	0,75	0,96	0,03	3,4	75	0,375	0,5	12,5
4	3	0,125	0,4	0,41	0,05	4,6	96	0,875	0,25	65
5	4	1,5	0,6	0,35	0,06	5,8	35	0,125	0,875	45
6	0,4	2,5	7	0,29	0,09	6,7	49	0,625	2,65	25
7	5	7,5	0,6	0,74	0,075	8,4	52	0,745	2,5	96
8	6	5	0,8	0,92	0,025	9,9	66	0,135	6,5	75
9	0,5	3	0,9	0,55	0,015	1,8	77	0,485	0,75	0,75
10	0,6	0,4	3	0,87	0,0125	2,2	82	0,585	8,5	0,135
11	0,7	0,6	4	0,99	0,04	3,1	13	0,675	0,95	0,785
12	0,8	7	6	0,34	0,07	4,1	28	0,825	0,15	0,95
13	7	0,8	2	0,54	0,08	5,2	34	0,965	0,445	0,665
14	8	9	1	0,66	0,09	6,2	47	0,715	0,985	6,25
15	9	0,9	8	0,77	0,065	7,75	59	0,775	0,645	1,85
16	0,9	8	0,15	0,39	0,045	2,25	64	0,345	0,8	0,685
17	1	1	12,5	0,44	0,085	3,25	78	0,615	0,9	1,65

Moldan hajm 1-4 - bosqich javoblari				
	1-b	2-b	3-b	4-b
1	716,8	13,888	103,04	582,4
2	582,4	16,8	58,24	174,72
3	761,6	12,992	76,16	1164,8
4	918,4	9,856	91,84	5,04
5	1164,8	21,728	117,6	29,12
6	1254,4	8,4	150,08	784
7	1411,2	9,52	105,28	940,8
8	1657,6	11,76	73,92	6,384
9	1971,2	14	56	15,008
10	2128	16,576	29,12	95,2
11	1904	2,688	221,76	148,96
12	1724,8	5,376	203,84	49,28
13	1478,4	8,064	192,64	1388,8
14	1209,6	10,752	168	1769,6
15	1164,8	13,888	153,44	268,8
16	963,2	16,576	98,56	7,504
17	873,6	19,712	60,48	19,824
18	492,8	21,504	82,88	22,288
19	246,4	18,368	64,96	17,36
20	358,4	17,024	35,84	77,28
21	649,6	17,36	24,64	215,04
22	828,8	14,896	49,28	8,512
23	985,6	13,216	87,36	116,48
24	1187,2	9,184	96,32	1187,2
25	1523,2	6,944	116,48	1456
26	1680	4,928	120,96	98,56
27	1926,4	3,136	148,96	9,744
28	2038,4	6,272	198,24	716,8
29	2217,6	8,512	211,68	82,88
30	291,2	10,752	151,2	212,8
31	560	12,096	133,28	21,616
32	739,2	13,888	53,76	17,248
33	1052,8	17,248	85,12	7,28
34	1500,8	19,712	50,4	336

Ko'paytiruv 1-14 - bosqich javoblari														
	1-b	2-b	3-b	4-b	5-b	6-b	7-b	8-b	9-b	10-b	11-b	12-b	13-b	14-b
1	3	6	15	28	20	18	28	48	27	80	99	108	117	14
2	8	18	24	36	15	48	35	56	63	30	33	84	65	70
3	2	10	18	32	45	12	49	32	9	90	55	48	91	84
4	5	14	12	4	40	30	21	16	53	20	77	72	104	42
5	7	16	21	24	30	42	14	56	72	50	55	36	78	28
6	1	8	9	12	5	54	49	72	36	30	33	96	39	98
7	4	4	27	28	25	18	35	40	18	40	44	60	52	56
8	8	12	6	8	35	30	28	64	81	80	99	12	26	112
9	3	2	15	20	20	42	56	24	45	50	22	108	65	126
10	6	18	24	36	15	12	63	40	27	90	55	48	91	70
11	2	6	3	32	10	24	21	16	63	40	33	72	13	42
12	5	10	12	16	45	42	7	48	36	20	77	36	78	28
13	8	16	21	24	30	54	56	32	72	80	55	24	39	98
14	7	14	9	4	40	48	42	64	63	40	99	60	104	56
15	4	8	27	28	35	36	35	24	45	70	33	108	117	84

Ko'paytiruv 14-28 - bosqich javoblari														
	15-b	16-b	17-b	18-b	19-b	20-b	21-b	22-b	23-b	24-b	25-b	26-b	27-b	28-b
1	45	64	153	36	95	60	168	176	161	168	175	208	162	140
2	60	112	85	90	133	80	126	154	115	48	225	52	81	24
3	120	16	102	162	114	140	189	88	46	216	125	156	54	196
4	90	96	136	54	152	80	42	110	23	72	75	78	108	112
5	105	32	68	108	76	40	147	66	92	96	50	104	189	84
6	30	80	119	144	38	180	84	198	69	144	200	234	243	56
7	15	144	34	18	171	100	21	132	207	192	100	182	216	252
8	135	128	51	72	19	60	63	44	184	120	150	208	162	168
9	45	64	17	126	57	140	168	176	138	168	225	130	81	224
10	60	112	153	90	133	80	126	22	161	48	125	52	54	196
11	75	48	85	36	114	40	189	154	46	216	175	78	108	112
12	120	96	102	54	152	160	42	88	115	96	74	156	135	84
13	90	32	68	108	95	100	105	66	92	144	50	234	243	140
14	105	80	136	144	76	60	147	110	207	72	200	182	216	252
15	135	144	34	126	171	180	84	132	184	120	100	104	189	56

Ko'paytiruv 29-42 - bosqich javoblari														
	29-b	30-b	31-b	32-b	33-b	34-b	35-b	36-b	37-b	38-b	39-b	40-b	41-b	42-b
1	145	240	217	96	297	102	210	108	122	190	234	160	164	252
2	261	180	124	224	264	272	140	144	185	114	312	200	205	378
3	174	120	62	192	165	306	105	216	74	228	351	80	82	336
4	58	240	155	64	66	238	70	180	259	266	117	320	369	210
5	232	270	186	288	231	204	315	288	333	152	156	160	246	294
6	116	90	248	256	99	170	175	252	296	342	195	360	328	168
7	87	120	279	160	198	68	245	324	148	304	78	280	287	126
8	203	210	93	96	132	272	280	108	222	76	234	320	123	252
9	145	150	124	224	264	306	140	144	185	114	273	200	164	84
10	261	270	217	192	165	204	210	216	111	190	312	240	205	336
11	174	60	62	288	231	238	70	72	259	228	351	120	82	210
12	58	270	186	160	99	170	315	180	333	152	117	160	369	378
13	116	150	248	256	297	136	105	288	148	304	156	200	246	168
14	87	90	279	128	132	272	175	324	296	190	195	280	287	126
15	232	210	155	192	264	306	280	252	222	228	234	80	123	294

Ko'paytiruv 43-56 - bosqich javoblari														
	43-b	44-b	45-b	46-b	47-b	48-b	49-b	50-b	51-b	52-b	53-b	54-b	55-b	56-b
1	387	308	315	368	235	336	343	250	255	364	318	162	495	224
2	129	220	405	276	94	288	441	150	102	156	159	324	110	504
3	215	176	360	92	188	192	245	400	408	260	477	486	385	280
4	86	88	180	184	423	384	392	250	153	468	318	216	220	168
5	344	352	270	138	329	240	92	450	459	156	212	378	330	392
6	172	132	135	230	282	96	147	100	306	468	424	270	440	112
7	301	264	90	322	376	144	196	400	204	416	159	432	110	448
8	387	396	225	368	141	336	343	200	306	364	212	270	220	280
9	258	308	315	92	235	192	294	450	459	208	371	324	495	392
10	129	220	360	184	94	384	441	150	102	416	265	108	165	224
11	86	88	405	138	188	288	245	350	204	260	106	432	275	168
12	344	352	270	230	329	96	392	100	306	468	477	270	495	448
13	301	176	135	276	423	240	98	300	459	156	212	486	220	112
14	172	132	90	414	376	432	147	450	204	468	271	324	330	392
15	258	264	180	368	282	144	196	200	408	208	265	378	110	224

Ko'paytiruv 57-70 - bosqich javoblari														
	57-b	58-b	59-b	60-b	61-b	62-b	63-b	64-b	65-b	66-b	67-b	68-b	69-b	70-b
1	114	522	177	420	488	310	189	512	585	462	536	340	552	560
2	513	464	118	180	183	186	567	320	455	264	268	204	345	420
3	171	406	531	540	244	558	378	192	325	396	201	612	483	630
4	456	232	472	300	122	248	126	448	195	594	335	272	621	280
5	513	348	236	120	427	372	315	576	520	132	469	408	414	490
6	228	290	354	240	366	496	441	384	390	330	603	544	138	140
7	285	174	413	360	305	434	252	256	260	198	134	476	276	350
8	399	116	177	480	549	124	504	128	130	528	402	136	207	210
9	342	464	118	180	488	558	378	448	455	396	268	612	621	630
10	171	522	472	540	183	310	567	384	195	462	469	340	345	490
11	399	232	236	420	122	496	315	192	585	594	536	544	552	350
12	285	406	354	120	427	248	441	256	260	330	201	272	276	560
13	342	290	295	300	244	434	189	512	520	264	335	476	483	420
14	456	174	531	240	366	186	504	320	325	528	603	204	207	280
15	228	348	413	360	305	372	252	576	390	198	402	408	414	210

Ko'paytiruv 71-84 - bosqich javoblari														
	71-b	72-b	73-b	74-b	75-b	76-b	77-b	78-b	79-b	80-b	81-b	82-b	83-b	84-b
1	639	144	584	222	300	532	616	468	395	320	567	738	664	588
2	497	360	292	370	675	684	154	312	711	560	324	656	415	672
3	355	648	657	592	225	456	385	702	553	240	648	492	332	336
4	284	432	511	518	525	608	539	234	474	400	729	328	747	756
5	568	216	146	666	150	380	231	390	632	640	405	574	581	425
6	426	504	365	148	375	228	693	624	237	480	243	410	498	252
7	142	288	219	296	600	152	462	156	316	720	486	246	249	168
8	213	576	438	222	450	304	308	546	158	160	162	164	166	504
9	355	648	657	444	300	456	385	312	553	240	729	656	415	756
10	497	432	365	592	600	684	616	702	395	400	567	410	581	425
11	639	360	584	370	375	380	462	624	711	640	324	574	664	588
12	426	504	511	666	675	532	693	234	474	480	648	738	332	672
13	568	288	219	296	525	228	539	390	632	720	486	246	498	252
14	213	576	438	222	225	304	231	624	316	320	405	492	747	504
15	284	216	292	518	450	608	308	546	237	560	243	328	249	336

Ko'paytiruv 85-98 - bosqich javoblari														
	85-b	86-b	87-b	88-b	89-b	90-b	91-b	92-b	93-b	94-b	95-b	96-b	97-b	98-b
1	765	516	783	176	623	630	364	276	837	470	190	768	194	294
2	340	172	609	704	801	360	728	184	186	658	380	576	388	196
3	680	602	348	616	712	810	273	736	465	282	665	480	582	686
4	595	344	522	440	178	540	546	460	744	188	285	672	776	784
5	255	774	174	264	267	720	819	828	558	846	570	288	873	588
6	170	430	435	792	534	450	182	644	651	376	760	192	485	882
7	510	258	783	440	356	180	455	552	372	752	855	384	679	392
8	425	688	696	352	623	270	637	276	279	564	380	864	291	294
9	255	602	261	528	445	720	728	368	465	470	475	768	388	686
10	680	430	609	616	801	360	364	736	837	282	665	480	582	490
11	765	774	783	704	712	810	546	460	558	658	570	576	776	784
12	425	688	522	792	534	450	819	828	651	846	760	672	485	588
13	595	344	435	440	267	630	455	644	744	376	855	288	679	392
14	340	516	348	264	623	540	637	276	372	752	380	384	873	882
15	510	258	261	352	356	270	728	368	465	564	475	864	291	686

Bo'luv 1-10 - bosqich javoblari										
	1-b	2-b	3-b	4-b	5-b	6-b	7-b	8-b	9-b	10-b
1	4	6	5	7	11	24	2,5	0,54	0,86	5,8
2	5	5	9	11	10	34	3,4	0,76	4,6	3,9
3	3	4	7	6	11	51	8,2	0,42	5,2	0,97
4	3	5	7	10	13	25	5,3	0,45	8,4	0,59
5	5	6	9	9	15	14	4,7	0,73	32	26
6	3	6	8	7	12	24	2,5	0,57	0,36	0,47
7	5	7	5	11	14	42	8,3	0,47	14	7,9
8	4	4	9	6	9	16	5,1	0,38	38	0,44
9	4	4	7	9	9	18	7,3	0,48	0,53	3,8
10	5	7	8	8	10	24	5,9	0,87	9,2	9,5
11	3	5	6	8	12	61	3,6	0,94	2,8	0,75
12	4	6	8	10	13	33	6,5	0,44	41	0,44
13	5	5	6	6	12	53	3,2	0,77	0,64	2,3
14	3	6	8	6	7	23	6,2	0,46	5,7	5,7
15	5	6	9	8	8	19	3,5	0,37	19	73

Qulay son 1-7 - bosqich javoblari							
	1-b	2-b	3-b	4-b	5-b	6-b	7-b
1	15	6	10	187,5	150	22,5	112,5
2	11,5	50	5120	8,1	40	100	40
3	15	85	2400	67,5	93,75	12,5	50
4	62,5	98	17,8	64	52	6,75	80
5	51	126	12,6	36	28	68	60
6	235	12,25	500	42	50	31	320
7	40	46,6	800	72	6,65	112	3
8	120	17,75	40,25	19	50	425	300
9	300	21	1500	136	0,3	40	110
10	39,6	8,64	0,5	250	375	30	175
11	9	13,5	270	6,4	76,5	64	6
12	3,75	9	110	12,25	100	120	200
13	15	1,55	165	29,25	8,5	9,6	15
14	192	11,5	12,75	17,5	11	27	4,5
15	37,5	104	120	63	6,2	34,5	24,08
16	448	156,6	0,6	120	6,35	10	15,05
17	28	208	125	36	11,3	36	4,515
18	80,1	106	5	5,4	48	60	3,75
19	320	189	11	0,6	1,92	252	90
20	20	196	1630	3	126	13,2	240

Ko'paytiruv 1-5 - bosqich javoblari					
	1-b	2-b	3-b	4-b	5-b
1	7,28	8,58	34,58	319,2	86,4
2	5,18	6,86	60,76	595,2	54,6
3	44,24	31,36	143,36	1408	434,5
4	24,94	20,59	233,59	2368,8	252,3
5	25,52	57,42	115,42	1074,6	246,4
6	11,27	10,12	186,12	1776,6	96,6
7	14,22	16,92	106,92	1069,2	150,1
8	35,64	29,04	293,04	2797,2	363
9	8,14	4,44	82,88	784	83,6
10	17,82	22,77	183,77	1917,6	188,1
11	37,7	19,14	425,14	3811,6	357,5
12	5,85	4,42	283,22	3165,4	57,2
13	14,56	25,2	501,76	4928	143
14	28,08	20,16	188,16	1780,8	288
15	37,44	52,26	528,06	5348,3	355,2
16	29,44	42,88	176,88	1636,8	294,4
17	72,52	65,12	182,04	1771,2	735
18	26,28	68,62	350,62	3431,6	255,5
19	16,32	13,94	149,94	1367,1	153,6
20	9,88	24,32	120,32	1466,4	114
21	43,68	74,1	386,1	3811,5	420
22	59,63	56,28	476,28	4819,5	589,6
23	2,76	17,25	178,25	1937,5	28,8
24	14,96	25,16	617,16	6338,4	153
25	36,3	42,24	636,24	6458,8	357,5
26	5,29	5,29	25,99	305,1	57,5
27	67,76	12,22	200,22	2108,7	654,5
28	51,35	43,45	280,45	2769	487,5
29	10,58	7,82	14,62	133,3	105,8
30	34,56	34,56	39,96	414,4	358,4

Bo'luv 1-5 - bosqich javoblari					
	1-b	2-b	3-b	4-b	5-b
1	1,92	16,78	0,368	274,07	2,371
2	2,25	18,286	0,479	140,625	2,689
3	2,611	13,387	0,439	67,925	6,065
4	1,439	9,048	0,564	150,000	3,545
5	2,846	13,696	0,405	196,875	5,120
6	4,588	17,692	0,329	50,575	3,784
7	2,385	10,541	0,417	155,814	2,892
8	1,706	7,500	0,724	48,936	2,149
9	1,875	15,946	0,577	33,962	1,948
10	1,979	12,297	0,246	79,412	4,350
11	3,526	16,604	0,446	61,111	2,261
12	1,867	9,024	0,483	173,684	3,201
13	2,429	12,500	0,355	40,230	2,816
14	4,588	16,889	0,660	273,913	7,072
15	1,417	10,962	0,873	226,667	4,205
16	1,769	16,792	0,284	59,259	4,694
17	2,042	5,968	0,302	110,811	3,237
18	1,730	34,167	0,484	44,231	2,815
19	5,188	19,211	0,452	87,671	4,850
20	3,538	9,368	0,397	127,778	4,647
21	2,056	9,048	0,548	121,622	3,018
22	2,231	18,511	0,716	68,519	2,023
23	1,480	26,538	0,581	66,667	1,972
24	2,438	7,260	0,328	47,368	3,105
25	2,435	16,087	0,296	59,259	6,545

Tenglama 1-2 - holat javoblari					
	1-holat			2-holat	
1	$x = 0{,}2$; $y = 0{,}4$	$x = 0{,}4$; $y = 0{,}2$	$x = 0{,}4$; $y = 0{,}6$	$n = 5$	$x = 0{,}2$
2	$x = 0{,}5$; $y = 0{,}5$	$x = 0{,}4$; $y = 0{,}2$	$x = 1$; $y = 2$	$n = 7$	$x = 0{,}25$
3	$x = 0{,}7$; $y = 0{,}3$	$x = 1$; $y = 2$	$x = 2$; $y = 1$	$n = 2$	$x = 0{,}5$
4	$x = 0{,}25$; $y = 0{,}5$	$x = 0{,}2$; $y = 0{,}5$	$x = 2$; $y = 1{,}5$	$n = 0{,}5$	$x = 0{,}2$
5	$x = 0{,}8$; $y = 0{,}4$	$x = 0{,}25$; $y = 0{,}75$	$x = 1{,}5$; $y = 3{,}5$	$n = 10$	$x = 0{,}75$
6	$x = 1{,}5$; $y = 1{,}5$	$x = 0{,}4$; $y = 0{,}6$	$x = 1$; $y = 4$	$n = 10$	$x = 0{,}3$
7	$x = 0{,}8$; $y = 0{,}2$	$x = 1{,}5$; $y = 1$	$x = 1{,}5$; $y = 1$	$n = 18$	$x = 1{,}25$
8	$x = 0{,}4$; $y = 0{,}6$	$x = 0{,}3$; $y = 0{,}4$	$x = 3{,}5$; $y = 2{,}5$	$n = 10$	$x = 7{,}2$
9	$x = 0{,}35$; $y = 0{,}65$	$x = 0{,}25$; $y = 0{,}5$	$x = 0{,}45$; $y = 0{,}55$	$n = 6$	$x = 2{,}5$
10	$x = 0{,}85$; $y = 0{,}15$	$x = 0{,}3$; $y = 0{,}5$	$x = 0{,}75$; $y = 0{,}5$	$n = 2$	$x = 2{,}56$
11	$x = 0{,}45$; $y = 0{,}55$	$x = 1{,}5$; $y = 2{,}5$	$x = 0{,}65$; $y = 0{,}35$	$n = 3$	$x = 1{,}2$
12	$x = 0{,}6$; $y = 0{,}4$	$x = 0{,}03$; $y = 0{,}01$	$x = 0{,}8$; $y = 0{,}2$	$n = 4$	$x = 0{,}287$
13	$x = 1{,}5$; $y = 0{,}5$	$x = 0{,}04$; $y = 0{,}02$	$x = 1$; $y = 1$	$n = 2$	$x = 4$
14	$x = 0{,}5$; $y = 1$	$x = 0{,}04$; $y = 0{,}06$	$x = 1$; $y = 2$	$n = 3$	$x = 5$
15	$x = 1{,}5$; $y = 1{,}5$	$x = 0{,}04$; $y = 0{,}04$	$x = 0{,}3$; $y = 0{,}7$	$n = 3$	$x = 10$
16				$n = 1$	$x = 0{,}5$
17				$n = 2$	$x = 1$

Tenglama 1-2 - bosqich javoblari					
	1-b	2-b		1-b	2-b
1	$x = 0{,}06$	$x = 6$	16	$x = -4$	$x = 11{,}67$
2	$x = -27$	$x = 0{,}5$	17	$x = 9$	$x = 3$
3	$x = 1$	$x = -2$	18	$x = 6$	$x = -1$
4	$x = 0{,}4$	$x = 3$	19	$x = 10$	$x = 3{,}8$
5	$x = 0{,}67$	$x = -1$	20	$x = 11$	$x = 6$
6	$x = 3{,}75$	$x = -11$	21	$x = -4$	$x = 7$
7	$x = 0{,}33$	$y = 13$	22	$x = 9$	$x = 46$
8	$x = 20$	$x = 0{,}5$	23	$x = 5$	$x = -11$
9	$x = 17$	$x = 1$	24	$x = 6$	$x = 2$
10	$x = 5$	$x = 1$	25	$y = -1$	$x = 2$
11	$x = 4$	$x = 1$	26	$x = 4$	$x = -1$
12	$x = 8$	$x = -2$	27	$x = 1$	$x = -3$
13	$x = 8{,}5$	$x = 1$	28	$x = 0{,}3$	$x = 1$
14	$x = 2$	$x = 1$	29	$x = 0{,}5$	$x = 1$
15	$x = 2$	$x = 2$	30	$x = 1$	$x = 1$

Bir hakimdan : "Nima uchun sizga yomonlik qilgan kishidan o'ch olmaysiz ?", deb so'radilar

U kulgancha : "Meni tishlagan itni men ham tishlashim kerakmi ?!", deb javob berdi.

Foydalanilgan adabiyotlar :

1. Organik kimyo 11-sinf uchun masalalar to'plami va ularning yechimi (Abdug'affor Mutalibov)

2. 7-11-sinflar uchun umumiy kimyo masalalar to'plami va ularning yechimi (Abdug'affor Mutalibov)

3. 10-sinf kimyo darslik (Mutalibov A.)

4. 5-sinf matematika darslik (Haydarov B.Q.)

5. 6-sinf matematika darslik (Mirzaahmedov M.A.)

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